

2006 Joint Chemical Biological, Radiological and Nuclear (CBRN)
Conference & Exhibition

Fort Leonard Wood, MO
"Combating Weapons of Mass Destruction"

26-28 June 2006

Onsite Agenda

Tuesday, 27 June 2006

Keynote Speaker - Combating WMD
Dr. Tegnelia, Director, Defense Threat Reduction Agency and Deputy Director, STRATCOM Center for Combating WMD

Chemical and Biological Defense and Chemical Demilitarization Program
COL Michael O'Keefe, USA, Chief of Staff to the Special Assistant for Chemical & Biological Defense and Chemical Demilitarization Programs

Joint Requirements Office-Chemical Biological, Radiological and Nuclear Defense Office Update
MG Bromberg, USA

Joint Combat Developer Update
BG Stanley H. Lillie, USA

Medical Research and Material Command
COL James Romano, USA

International Panel:
Moderator:
- COL Patrick Sharon, USA
Panelists:
- MAJ Tim Mertsock, USA
- Major Jim Cameron, British Army
- Colonel Ho Kong Wai, Singapore Armed Forces

Wednesday, 28 June 2006

Keynote Speaker - CERFP
Maj Gen Annette Sobel, USAF, J-2, National Guard Bureau

Joint Science and Technology Office
Dr. Charles R. Gallaway, Director, Joint Science Technology Office for Chemical and Biological Defense, DTRA

Joint Program Executive Office Update
MG Steve Reeves, USA Program Executive Officer for Chemical and Biological Defense

Technology Panel
- Chairman: BG Dean Ertwine, USA (Ret), NDIA Chem-Bio Defense Division
- Panelists: MG John Doesburg, USA (Ret)

Onsite Program

June 26-28, 2006
Ft. Leonard Wood, MO



Joint CBRN Conference & Exhibition

June 26-28, 2006

Fort Leonard Wood, MO

"Combating Weapons of Mass Destruction"

Proliferation of the capability for nations and terrorist organizations to employ CBRN weapons on the battlefield or against American citizens in the homeland and overseas makes the Chemical Corps' role in the defense of our country more vital than ever before. It is important for the chemical community, the military and civilian employees of the Services and other government agencies, our international partners, contractors, industry, and academia, to come together and share information about our capabilities to defend against CBRN weapons and our requirements for the future.

The Joint CBRN conference does that.

"The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD Component commands or organizations are responsible for approving attendance of its DoD employees based on mission requirements and DoD regulations."
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AGENDA

Monday, June 26, 2006

12:00PM – 5:00PM **Registration for Joint CBRN Conference**
Exhibit Pavilion outside of
Nutter Field House

5:00PM – 7:00PM **Reception in Exhibit Areas**
Nutter Field House & Exhibit Pavilion
(Dress: Business casual or golf attire)

Tuesday, June 27, 2006

7:00AM - 5:00PM **Registration**
Exhibit Pavilion

7:00AM – 8:15AM **Continental Breakfast**
Exhibit Areas

7:00AM – 5:45PM **Exhibits Open**
Nutter Field House & Exhibit Pavilion

8:30AM – 8:45AM **Opening Ceremonies**
Abrams Theater

NDIA Welcome
BG Walt Busbee, USA (Ret)
Chairman, NDIA Chem Bio Defense Division
Abrams Theater

Chief of Chemical Welcome
BG Stanley H. Lillie, USA
Commandant, US Army Chemical School
Abrams Theater

Tuesday June 27, 2006 Cont.

8:45AM – 9:30AM **Keynote Speaker**
Combating WMD
Dr. Tegnelia, Director, Defense Threat Reduction Agency and Deputy Director, STRATCOM Center for Combating WMD
Abrams Theater

9:30AM – 10:00AM **Break**
Exhibit Areas

10:00AM – 10:45AM **NORTHCOM Role in HLD**
MG Davis, USA
Joint Task Force-Civil Support
NORTHCOM
Abrams Theater

10:45AM – 11:30AM **Chemical and Biological Defense and Chemical Demilitarization Program**
COL Michael O'Keefe, USA
Chief of Staff to the Special Assistant for Chemical & Biological Defense and Chemical Demilitarization Programs
Abrams Theater

11:30AM – 1:00PM **Lunch**
Exhibit Areas

1:00PM – 1:45PM **Joint Requirements Office-Chemical Biological, Radiological and Nuclear Defense Office Update**
MG Bromberg, USA
Abrams Theater

Tuesday June 27, 2006 Cont.

1:45PM – 2:30PM **Joint Combat Developer Update**
BG Stanley H. Lillie, USA
Abrams Theater

2:30PM – 3:00PM **Medical Research and Material Command**
COL James Romano, USA
Abrams Theater

3:00PM – 3:30PM **Break**
Exhibit Areas

3:30PM – 5:00PM **International Panel**
Moderator: COL Patrick Sharon, USA
Panelists:MAJ Tim Mertsock, USA
Major Jim Cameron, British Army
Colonel Ho Kong Wai, Singapore Armed Forces
Abrams Theater

5:00PM **Adjourn for the Day**

Wednesday, June 28, 2006

7:30AM – 3:00PM **Registration and Continental Breakfast**
Exhibit Areas

8:20AM-8:25AM **Opening Remarks and Award Presentation**
Chairman: BG Dean Ertwine, USA (Ret)
Chairman, NDIA Chem Bio Defense Division

8:25AM-8:30AM **Keynote Introduction**
BG Stanley H. Lillie, USA
Abrams Theater

Wednesday, June 28, 2006 Cont.

8:30AM – 9:15AM **Keynote Speaker**
CERFP
Maj Gen Annette Sobel, USAF
J-2, National Guard Bureau
Abrams Theater

9:15AM – 10:00AM **Joint Science and Technology Office**
Dr. Charles R. Gallaway
Director, Joint Science Technology Office
for Chemical and Biological Defense, DTRA
Abrams Theater

10:00AM – 10:30AM **Break**
Exhibit Areas

10:30AM – 11:15AM **Joint Program Executive Office Update**
MG Steve Reeves, USA
Program Executive Officer for Chemical
and Biological Defense
Abrams Theater

11:15AM – 11:45AM **20th Support Command (CBRNE)**
BG Kevin Wendel, USA
Abrams Theater

11:45AM – 1:00PM **Lunch**
Exhibit Areas

Wednesday, June 28, 2006 Cont.

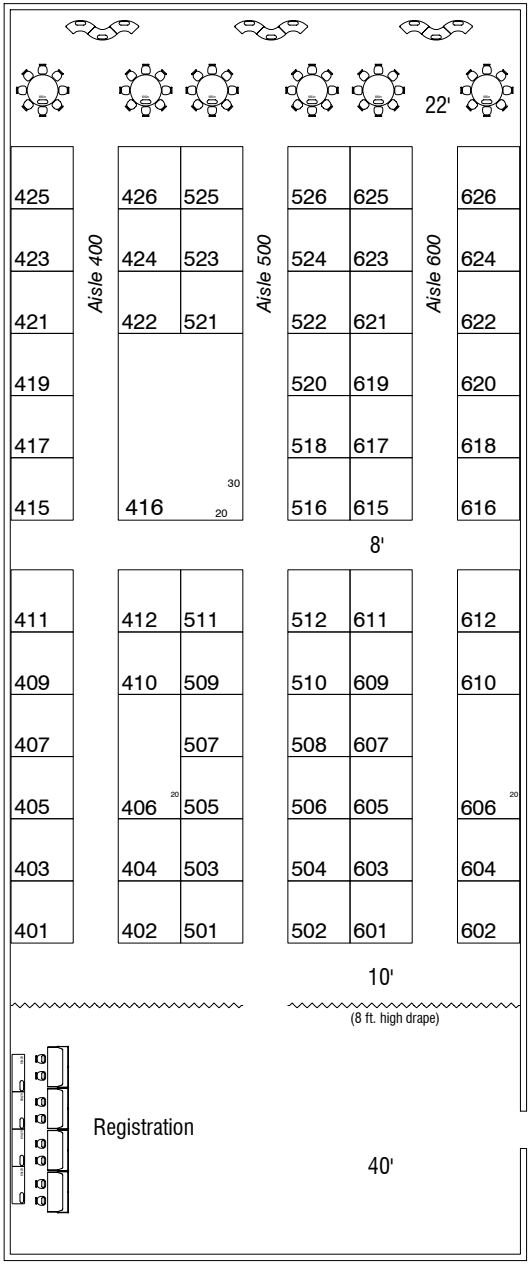
1:00PM – 2:30PM **Technology Panel**
BG Dean Ertwine, USA (Ret)
Chairman, NDIA Chem-Bio Defense Division
Panelists: MG John Doesburg, USA (Ret)
Director, Homeland Security Programs
Oak Ridge National Laboratory
Dr. Jeffrey Stiefel, Ph.D.
Program Executive Officer
Chemical and Biological Security Programs
Science and Technology Directorate
Department of Homeland Security
COL Ben Hagar
Deputy, Joint Science & Technology for
Chem-Bio Defense
Defense Threat Reduction Agency
Mr. Ed Wack
Director, Future Acquisition
JPEO-Chem-Bio Defense
Abrams Theater

2:30PM – 2:35PM **NDIA Closing Remarks**
BG Dean Ertwine, USA (Ret)
Chairman, NDIA Chem-Bio Defense Division
Abrams Theater

2:35PM – 4:00PM **Break**
Exhibit Areas

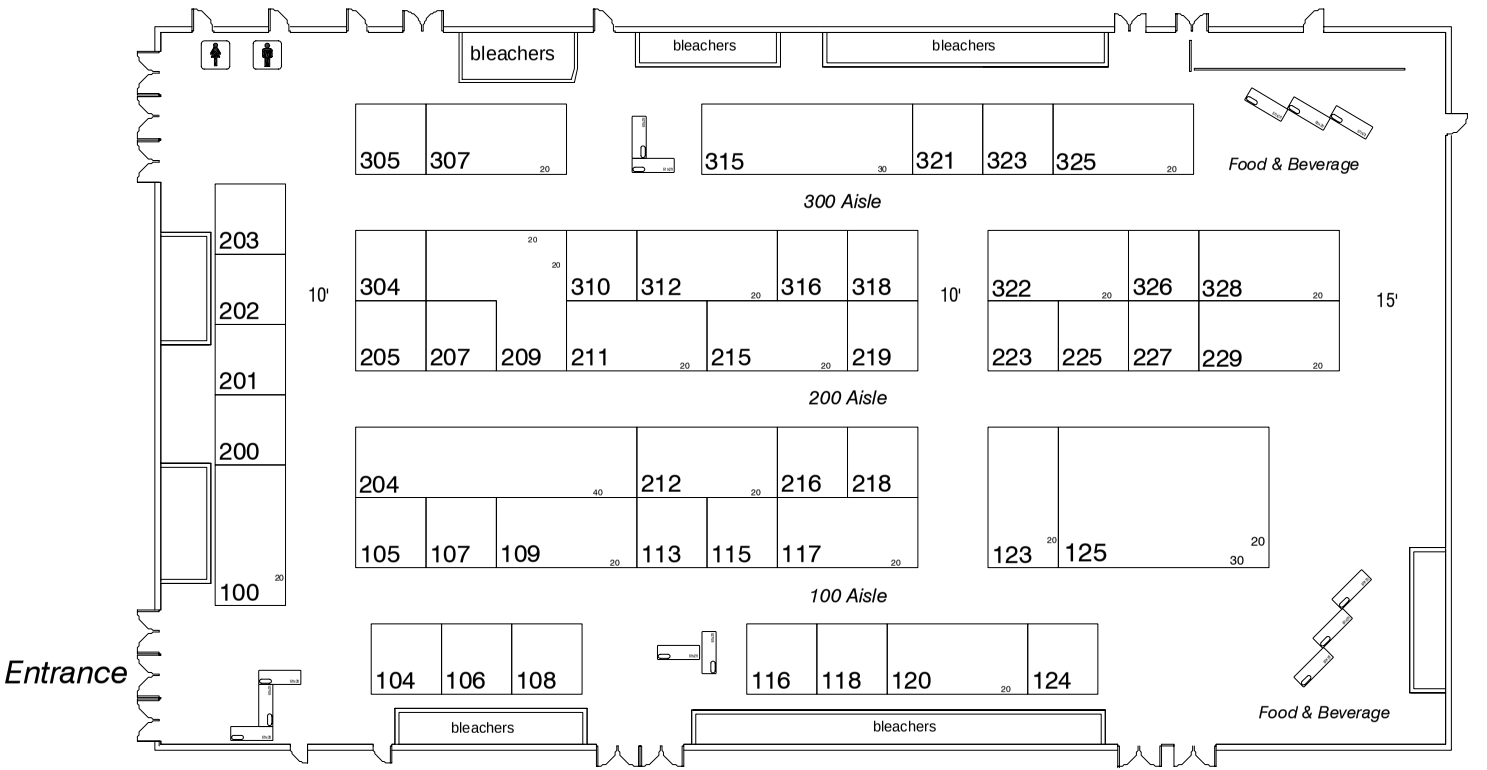
3:00PM – Complete **Demonstrations**
behind Exhibit Pavilion

Exhibits Pavilion
Fort Leonard Wood, Missouri



Exhibits Pavilion
82'x200'

Nutter Field House
Fort Leonard Wood, Missouri



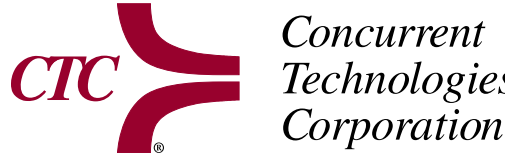
Exhibitors

Company Name	Booth #
Advanced Measurement Technology	616
Agentase	124
Ahura Corporation	323
Air Techniques International	200
AirBoss-Defense	412
Allen-Vanguard	401
Alluviam LLC	227
AMETEK- Aerospace & Defense	203
Arcadis	116
Argon Electronics	201
AristaTek Inc.	207
Aspen Systems, Inc.	509
Audiopack	305
Avon Protection Systems, Inc.	202
Base-X Shelters	22
Base-X Shelters	23
Battelle	322
Brimrose Corporation of America	610
Bruker Daltonics	307
BW Technologies	115
CamelBak	605
CBIAC	113
Chemical Corps Regimental Association	502
Chemical Corps Regimental Association	416
Clean Earth Technologies, LLC	507
Concurrent Technologies Corporation	215
Constellation Technology	212
Creative Building Products	617
Defense Threat Reduction Agency - PAO	122
Draeger Safety, Inc.	223
DRS Sustainment Systems, Inc.	123
DRS Sustainment Systems, Inc.	7
EAI Corporation	310
ECS	615
EG&G DMI	316
EMD Pharmaceuticals, Inc.	213
EnviroFoam Technologies	107
First Line Technology	21
General Dynamics - ATP	204
Gentex Corporation	603
Global Ground Support	205
Global Protection, llc	219
Griffin Analytical Technologies	124
Guardian Mfg Co	621
Hunter Manufacturing Company	109
IEM	609
INFICON	104
Intelagard, Inc.	105
ITT AES	209

Company Name	Booth #
JEAP	523
JPEO for Chem Bio Defense	125
JPEO for Chem Bio Defense	28
Kalman & Company, Inc.	525
LANX Fabric Systems	108
MacAulay Brown	119
MadahCom	503
MadahCom	18
MesoSystems Technology, Inc.	124
Military Medical Technology	611
Milliken & Company	607
Mobile Medical International Corp.	404
Morphix Technologies	118
NanoScale Materials	512
NBC International	225
NDIA	17
NDIA	1
Nor E First Response, Inc.	15
Northrop Grumman	19
Northrop Grumman	325
Nucsafe, Inc.	618
Oak Ridge National Laboratory	326
OI Analytical/CMS Field Products	602
Omni Measurement Systems, Inc.	510
OptiMetrics, Inc.	100
OWR Corp	504
Paul Boye Technologies	516
PDA LLC	211
Pine Bluff Arsenal	229
Proengin Inc	106
QuickSilver Analytics, Inc.	402
RADeCO, Inc	619
RAE Systems	501
Reeves EMS, LLC	24
Reeves EMS, LLC	26
Remploy Textiles	612
Safe Reflections, Inc	521
SafetyTech International, Inc.	606
SAIC	312
Sceptor Industries, Inc.	304
Scott Specialty Gases	601
Smiths Detection	315
Srategic Technology Enterprises, Inc.	506
Survival Inc.	511
Tex-Shield, Inc.	328
The Sigmon Group	218
TSI Incorporated	318
TVI Corporation	16
USAA	505
USAES-DEI	604
W. L. Gore & Associates, Inc.	321

Thank you to our sponsors.

















NATIONAL DEFENSE INDUSTRIAL ASSOCIATION

STRENGTH THROUGH INDUSTRY & TECHNOLOGY

See you next year!
June 25-27, 2007
Ft. Leonard Wood, MO

2111 Wilson Blvd., Suite 400 Arlington, VA 22201 703-522-1820

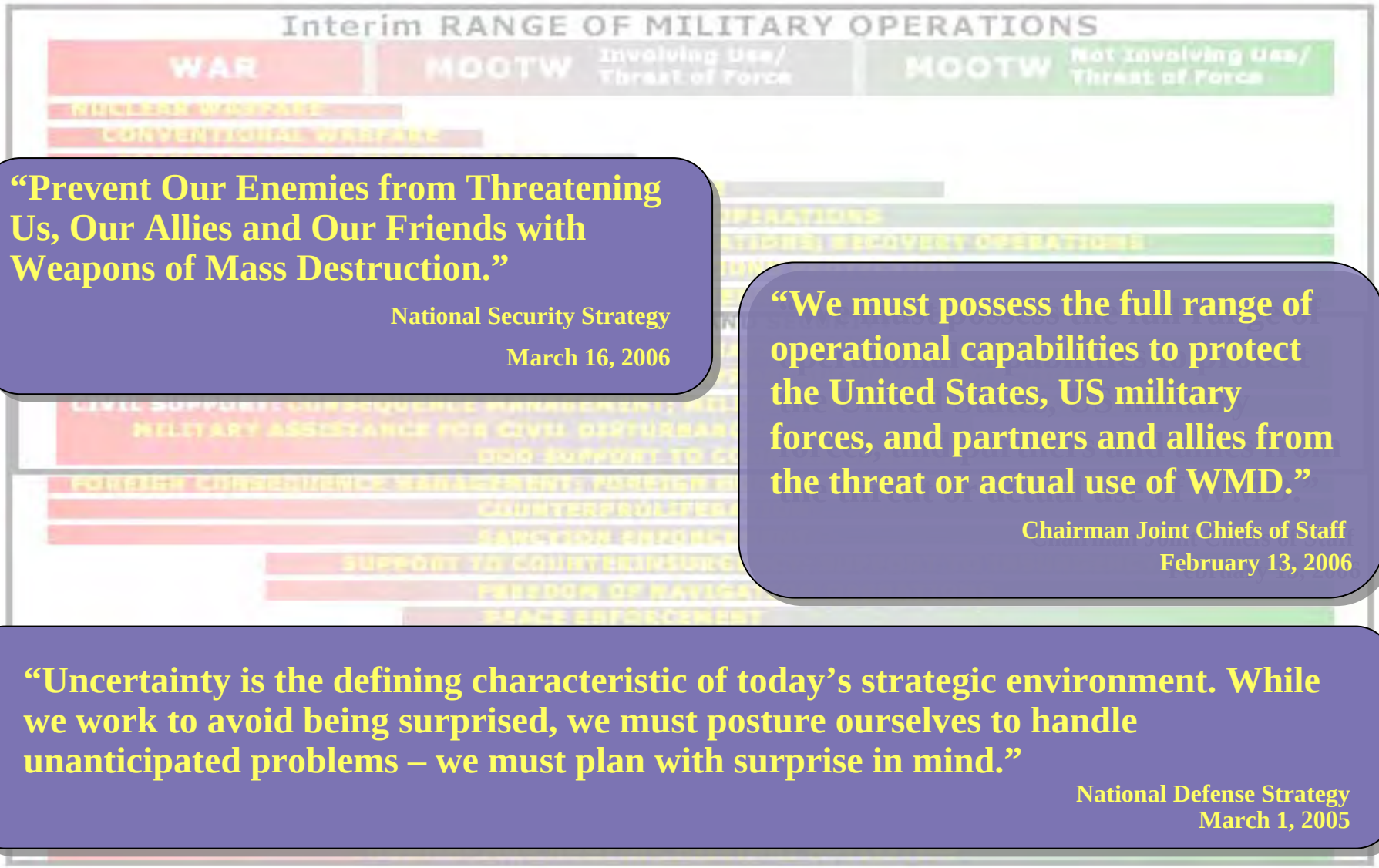
JOINT REQUIREMENTS OFFICE FOR CBRN DEFENSE



MG Howard Bromberg

Deputy Director for Force Protection (DDFP), J-8 and Director, JRO-CBRND

Strategic Environment



"Prevent Our Enemies from Threatening Us, Our Allies and Our Friends with Weapons of Mass Destruction."

National Security Strategy
March 16, 2006

"We must possess the full range of operational capabilities to protect the United States, US military forces, and partners and allies from the threat or actual use of WMD."

Chairman Joint Chiefs of Staff
February 13, 2006

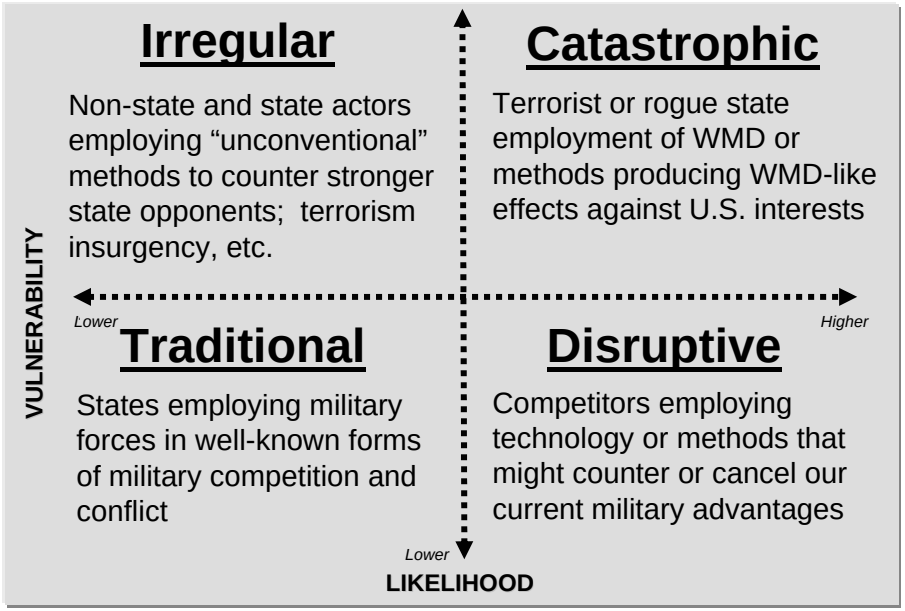
"Uncertainty is the defining characteristic of today's strategic environment. While we work to avoid being surprised, we must posture ourselves to handle unanticipated problems – we must plan with surprise in mind."

National Defense Strategy
March 1, 2005

QDR Objective – Shift in Focus

Provide more options for President, capabilities for CoComs

Post-9/11 Security Challenges



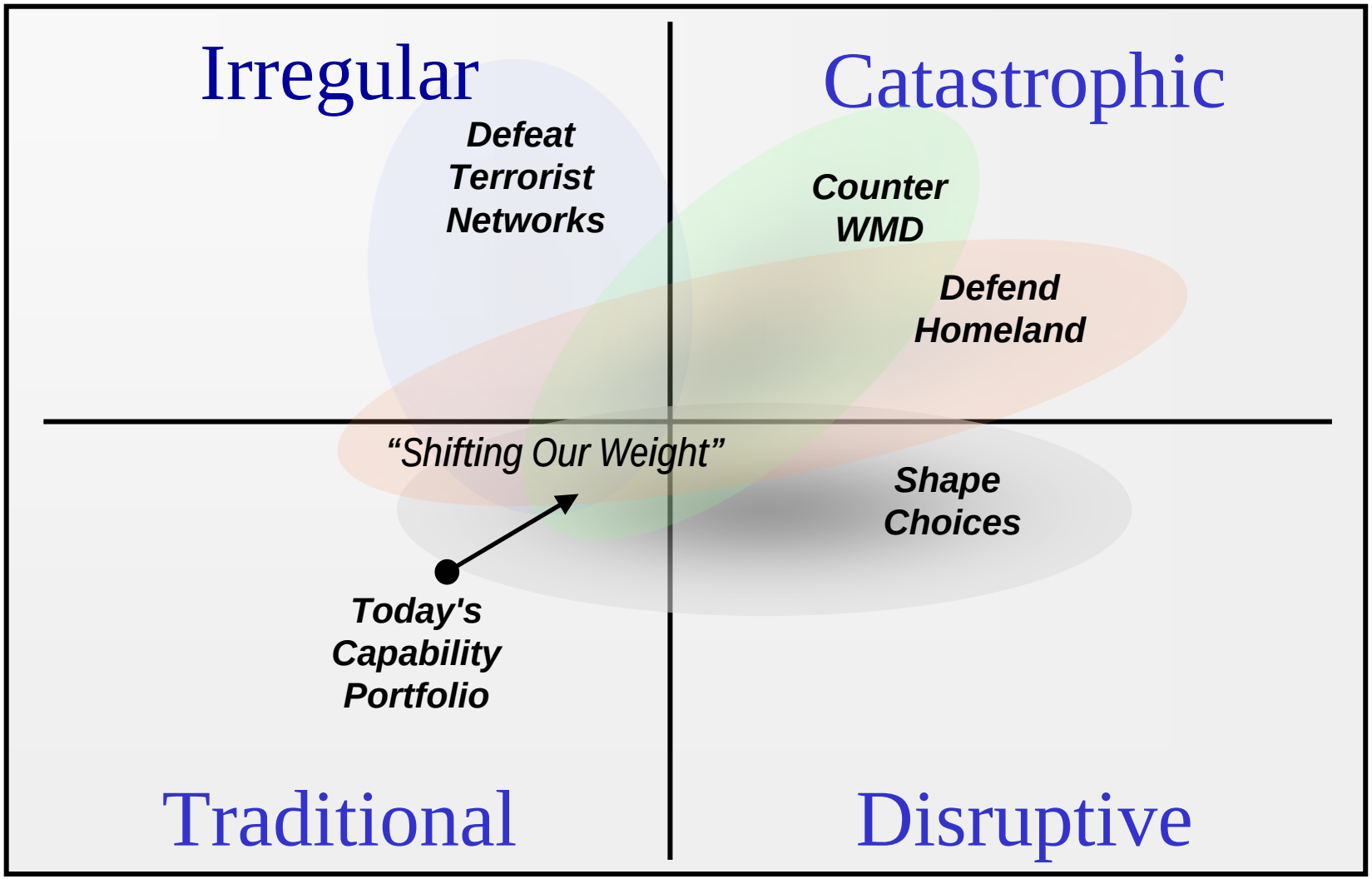
Options for President

Capabilities for COCOMs

Capability Focus Areas

- Defeat terrorist networks
- Defend homeland in depth
- Prevent acquisition or use of WMD
- Shape choices of countries at strategic crossroads
  (Assure, Dissuade, Deter, Defeat)

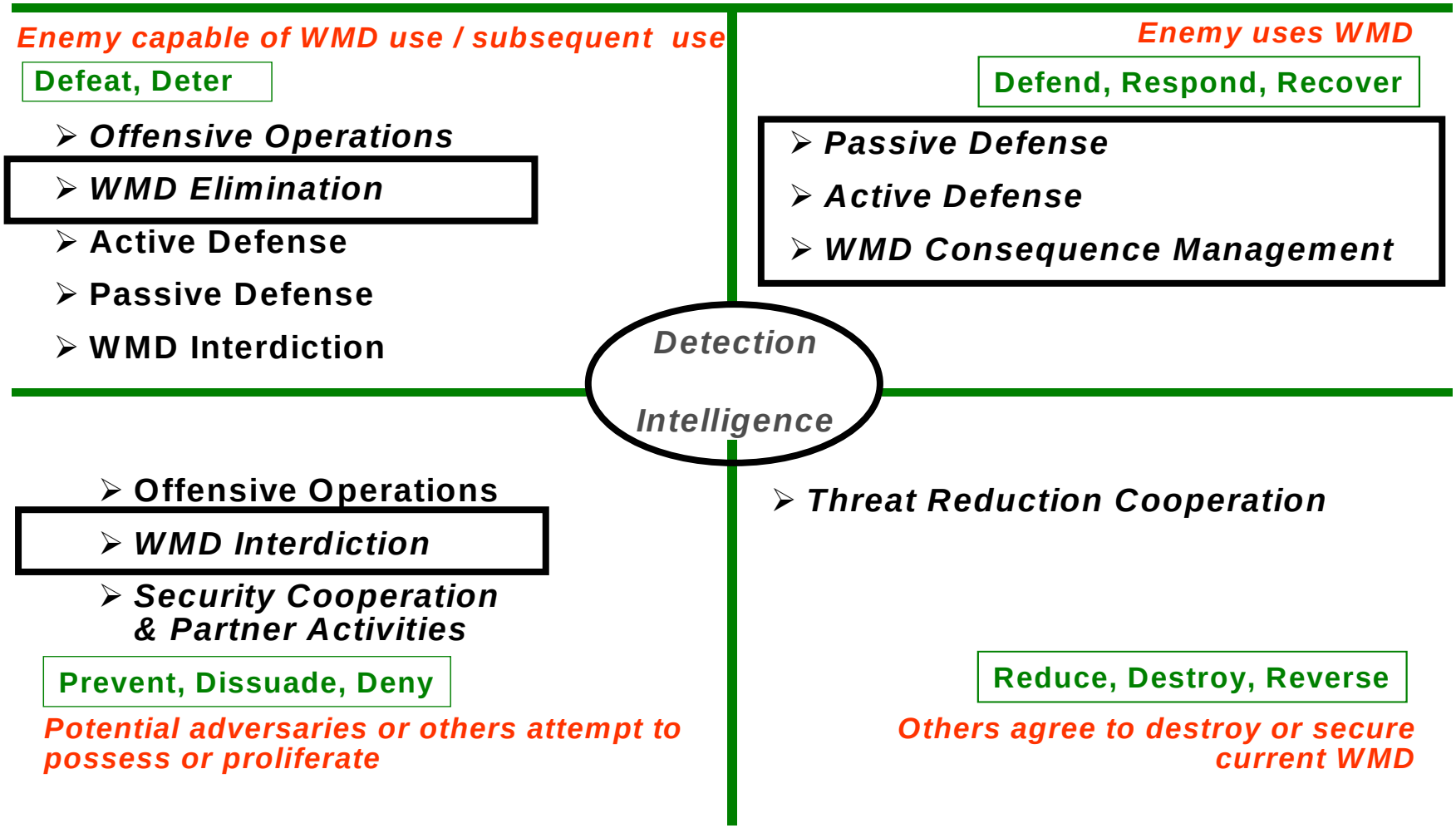
QDR Objective – Shift in Focus



Continuing the reorientation of military capabilities and implementing enterprise-wide reforms to ensure structures and process support the President and the warfighter

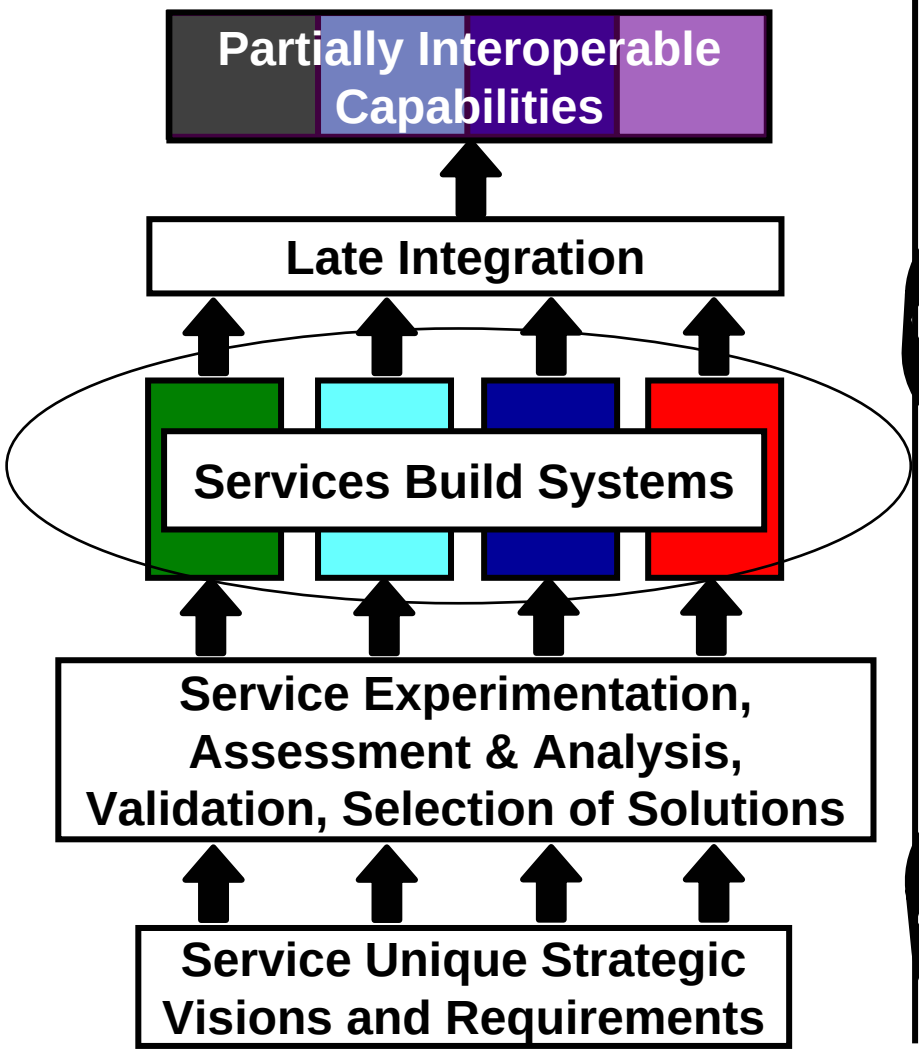
Combating WMD Mission Areas

Mission: Dissuade, deter, defend against & defeat those who seek to harm the U.S., its allies and partners through WMD use or threat of use, and, if attacked, mitigate the effects and restore deterrence .

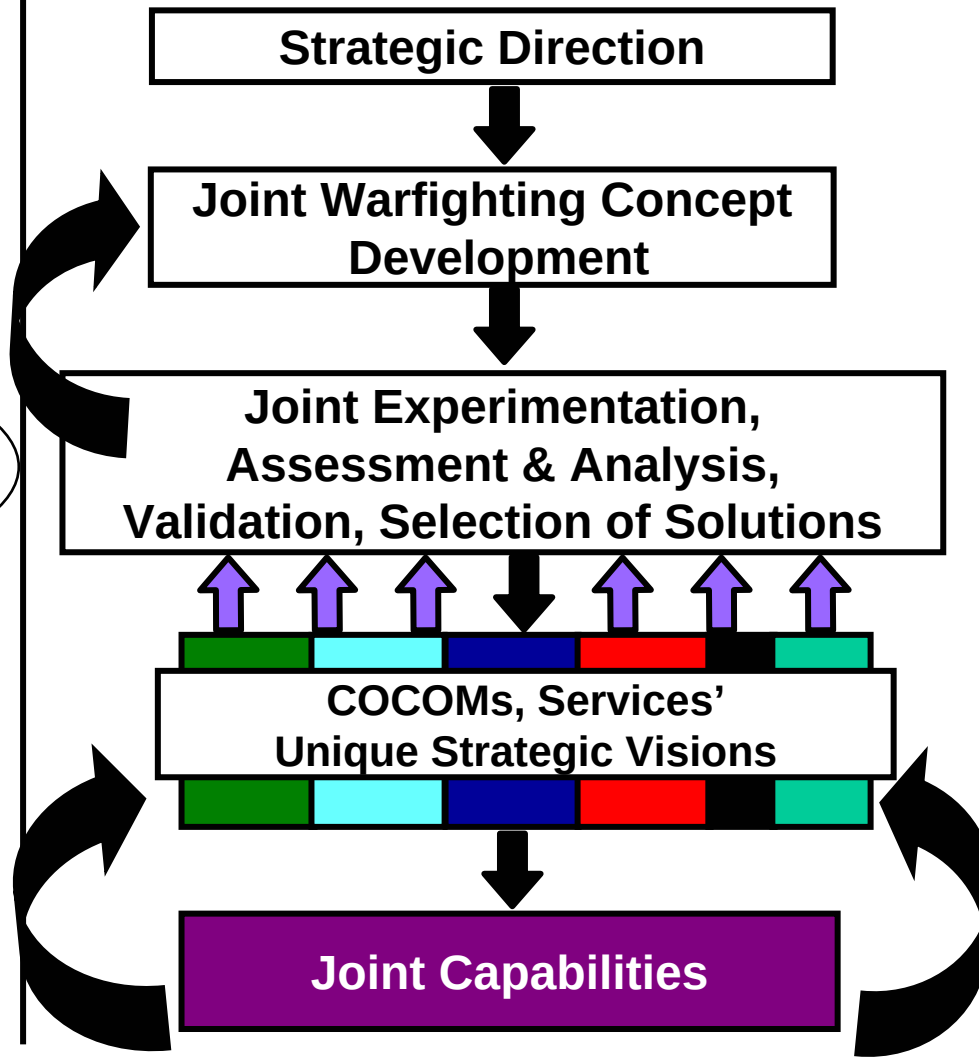


Threat vs Capability Based Planning

Requirements Generation System (RGS)- ~30 years of experiences



Joint Capabilities Integration and Development System (JCIDS)- 2 years old



The DoD Process

DAB Capability Area Reviews (CARs)

- Strategic Planning Guidance
- Defense Planning Scenarios
- Family of Concepts
- Transforma-tion

Capabilities Based Assessment

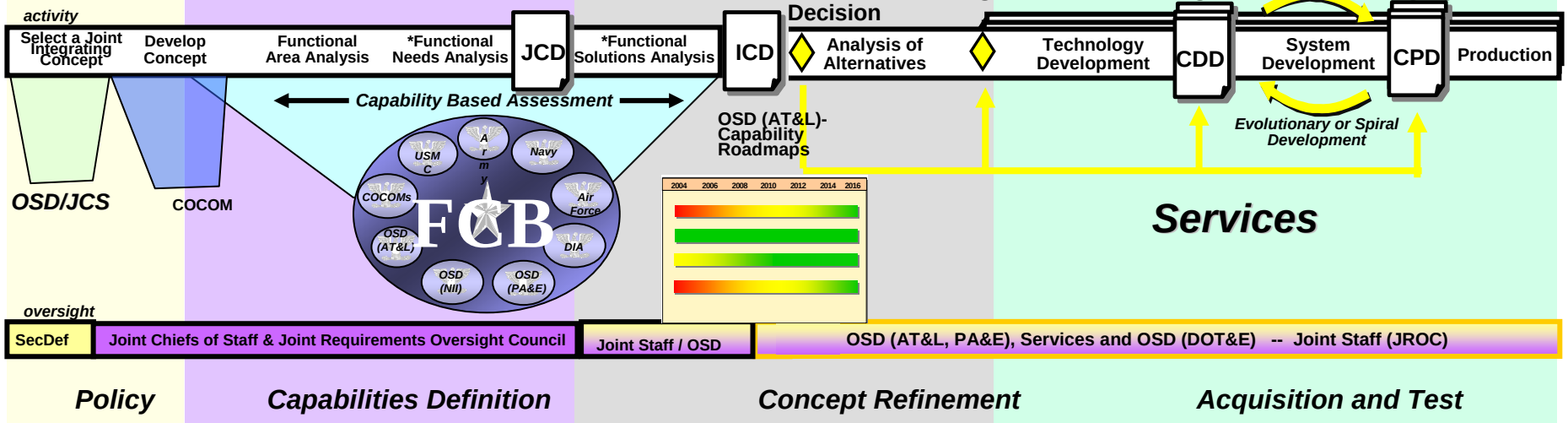
- Capabilities
- Tasks
- Attributes
- Metrics
- Gaps
- Shortfalls
- Redundancies
- Risk areas
- Non-materiel solutions
- Materiel solutions
- S+T initiatives
- Experimentation

- Refined concept
- Analysis of Alternatives
- Technology Development Strategy
- SoS System Engineering

- Affordable military-useful increment
- Technology demonstrated
- Initial KPPs
- SEP

- Revise KPPs
- Detailed design
- System integration
- DT&E

- LRIP
- IOT&E



Policy | *Capabilities Definition* | *Concept Refinement* | *Acquisition and Test*

Making Warfighter Needs Reality

Joint Staff and J8 DDFP Organization

Chairman of the Joint Chiefs of Staff
General Pace, U.S. Marine Corps

J-1 | J-2 | **J-3, Operations** | J-4 | **J-8, Force Structure, Resources, & Assessment Directorate VADM Chanik, U.S. Navy** | **J-5, Strategic Plans & Policy** | J-6 | J-7

Deputy Director for Resources Acquisition | Deputy Director for Force Application | **Deputy Director for Force Protection MG Bromberg, U.S. Army** | Deputy Director for Force Management

Joint Theater Air and Missile Defense Organization (JTAMDO)

- Homeland Air Security
- Air and Missile Defense

Joint Requirements Office – Chemical Biological, Radiological, & Nuclear (JRO-CBRN) Defense

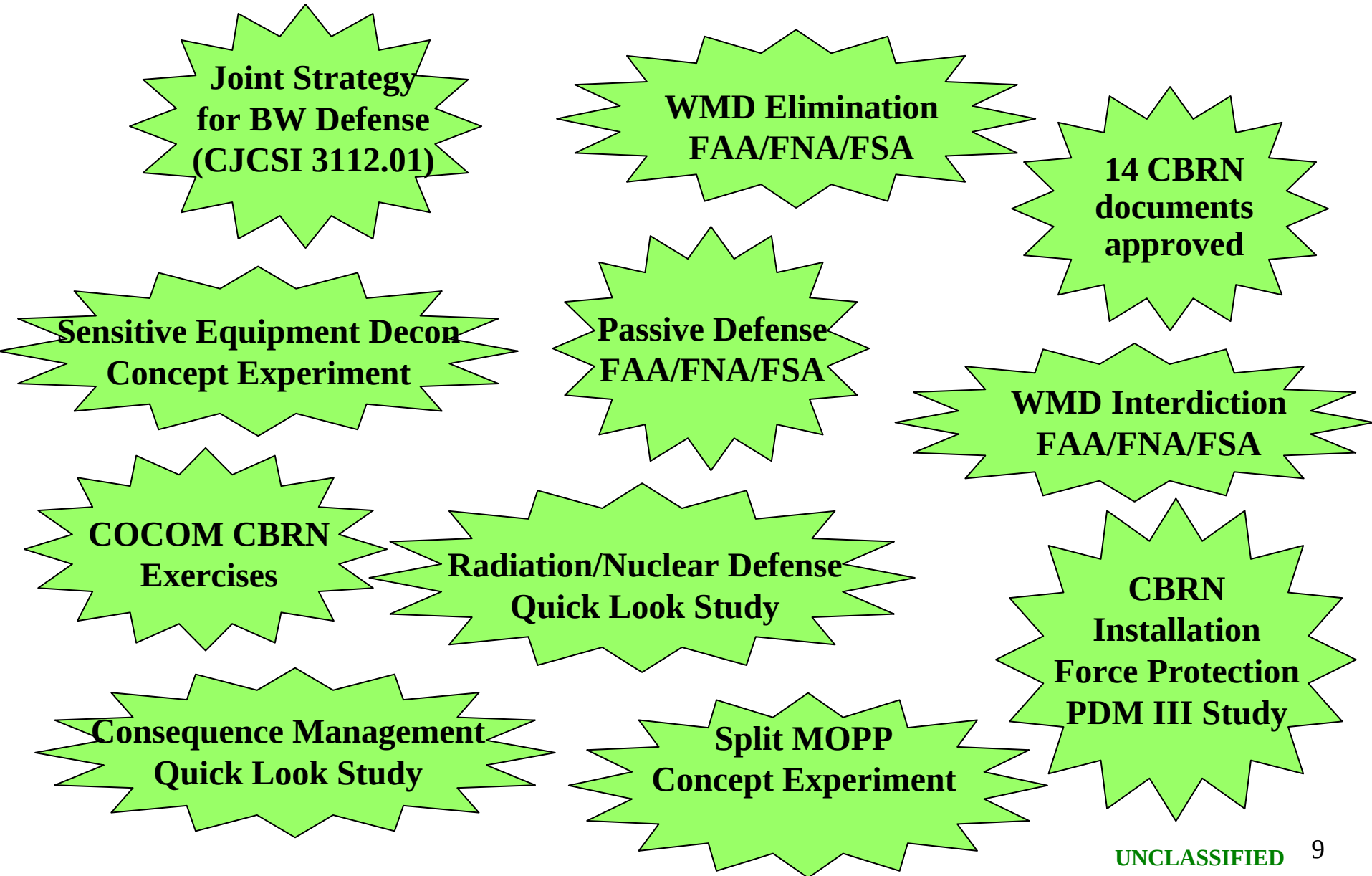
- CBRN Defense
  - Counter-proliferation
  - Non-proliferation
  - Consequence Management
- Homeland Defense

Protection Assessment Division

- Critical Infrastructure Protection
- Improvised Explosive Devices
- Personnel Protection
- Space Control Protection
- Insensitive Munitions
- Electronic Warfare Protection
- Continuity of Operations
- Continuity of Government

Services and COCOMS

JRO CBRND Accomplishments



JRO-CBRN Defense Current Actions

Sensor Mix Study

Consequence Management FAA/FNA/FSA

DOTMLPF Change Recommendations

Agent Challenge Study

WMD PME CJCSI 1800.01

CBRN Defense Program Objective Memorandum FY08-13

Robotic Decon Concept Experiment

Expendable Equipment Combat Consumption (E2C2) Study

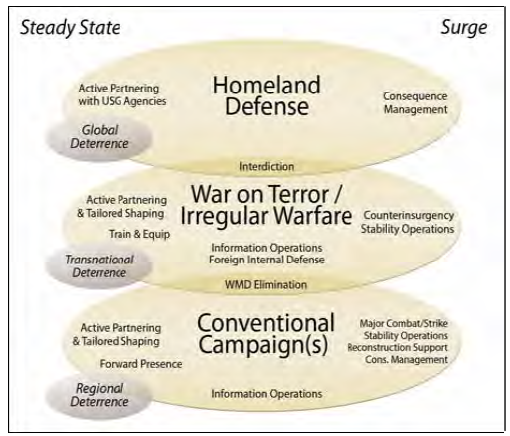
3 New CBRN ICD/CDD/CPD

Challenges

- **Modernize Consequence Management capabilities**
  - **WMD CST**
  - **CERFP**
  - **CBIRF**
  - **JTF CS**
- **New WMD Elimination capabilities**
  - **20th CBRNE Command to be JTF-Elimination HQ**
- **CBDP MILCON**
  - **Lab and T&E Infrastructure upgrades**

Summary

- **Program transforming with Strategic Environment**
  - Accept current operational risk
  - Invest to meet future challenges
  - Quadrennial Defense Review results
  - New Force Planning Guidance



- **STRATCOM as Combating WMD lead combatant commander**
  - Integrate and synchronize DOD capabilities
  - STRATCOM Center for Combating WMD (SCC)
  - Combating WMD Joint Integrating Concept
  - Priority to Interdiction and Elimination missions

Questions

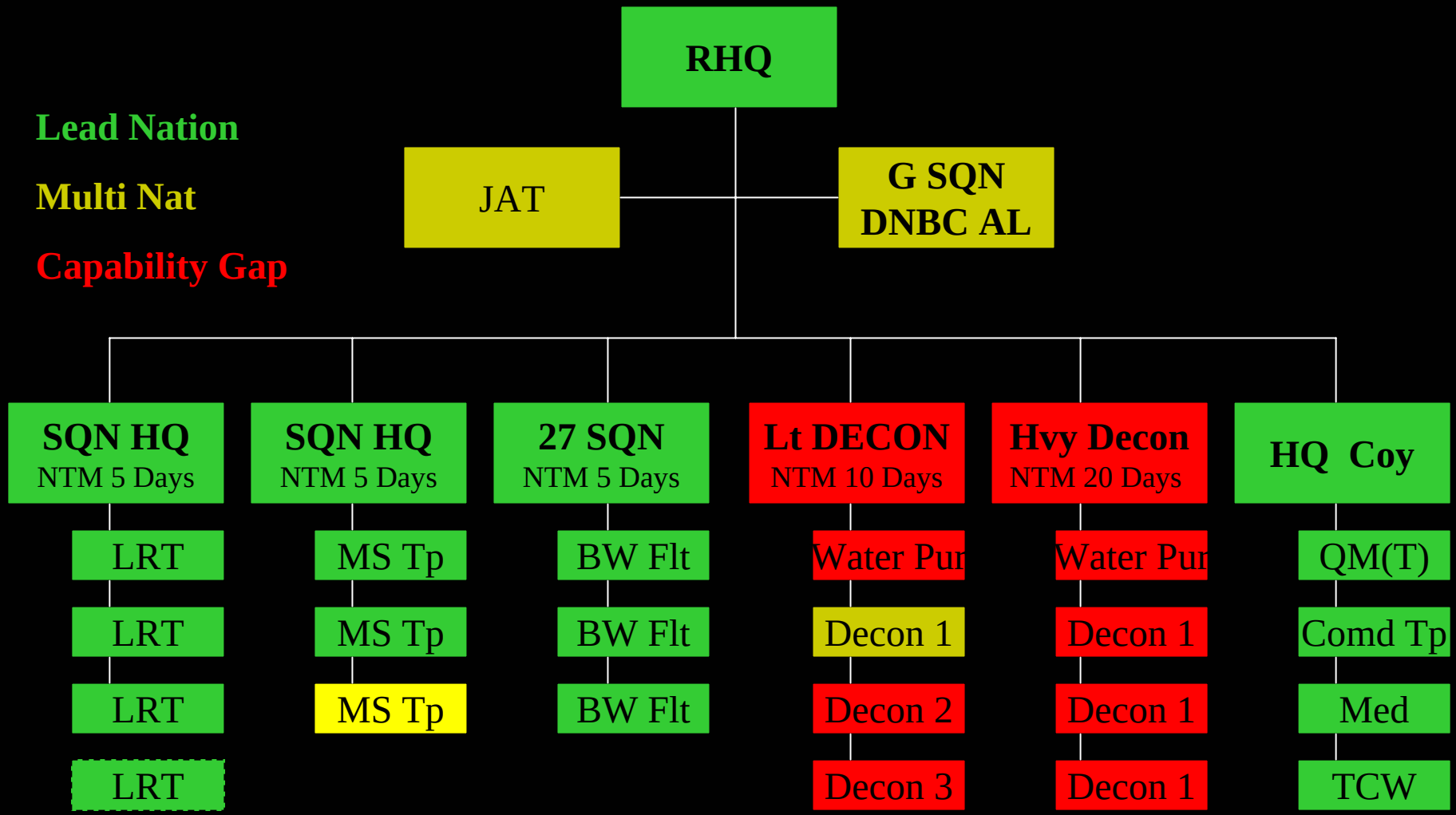
Major A J Cameron

OC NATO Deployable Analytical Laboratories

UK Joint CBRN Regiment



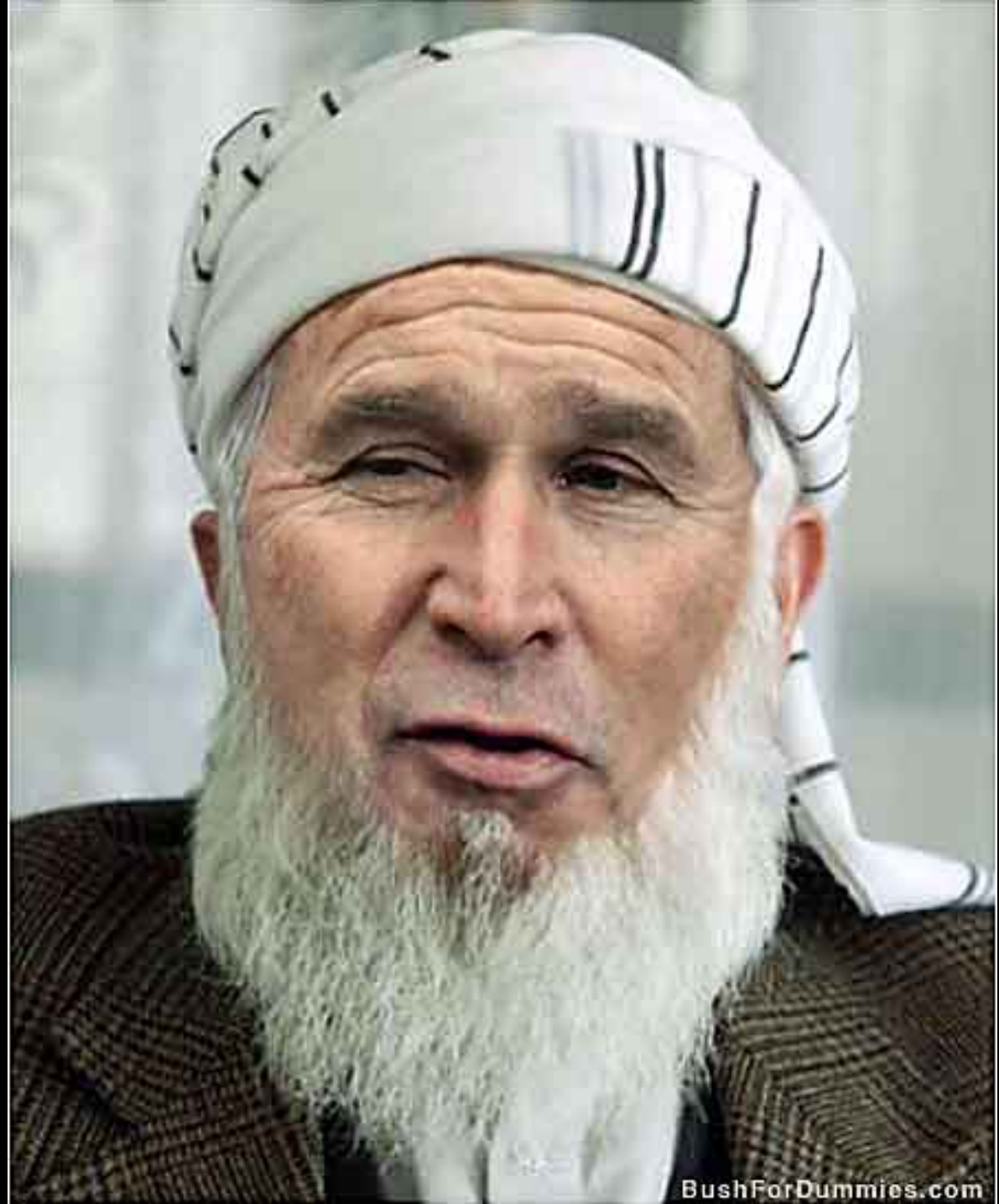
Jt CBRN Regt to CBRN Bn



NBC – AL Concept






BushForDummies.com


لا إله إلا الله محمد رسول الله
AFP

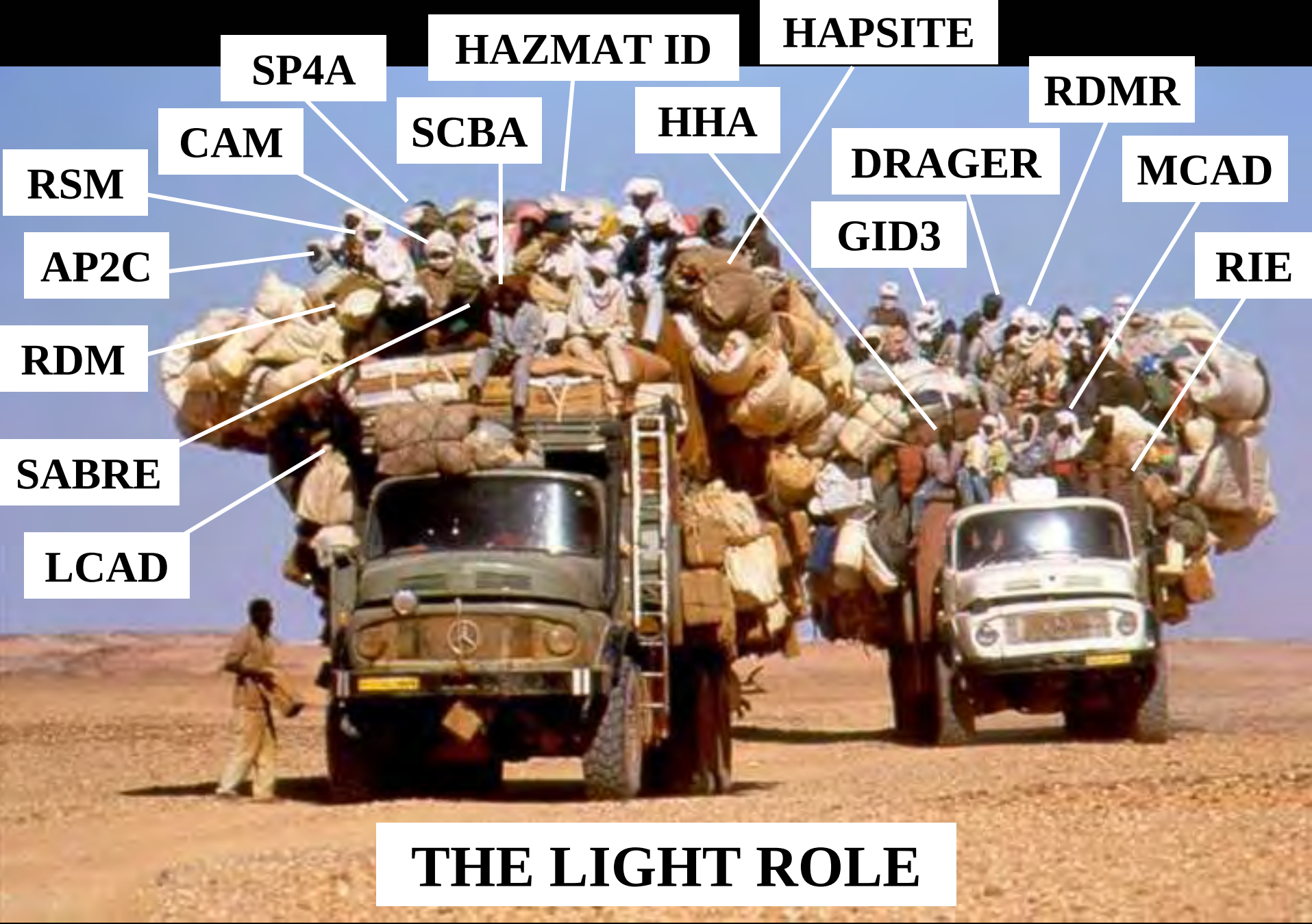




The Light Role Team




ATOM
BIO
GAS



THE LIGHT ROLE


Dräger



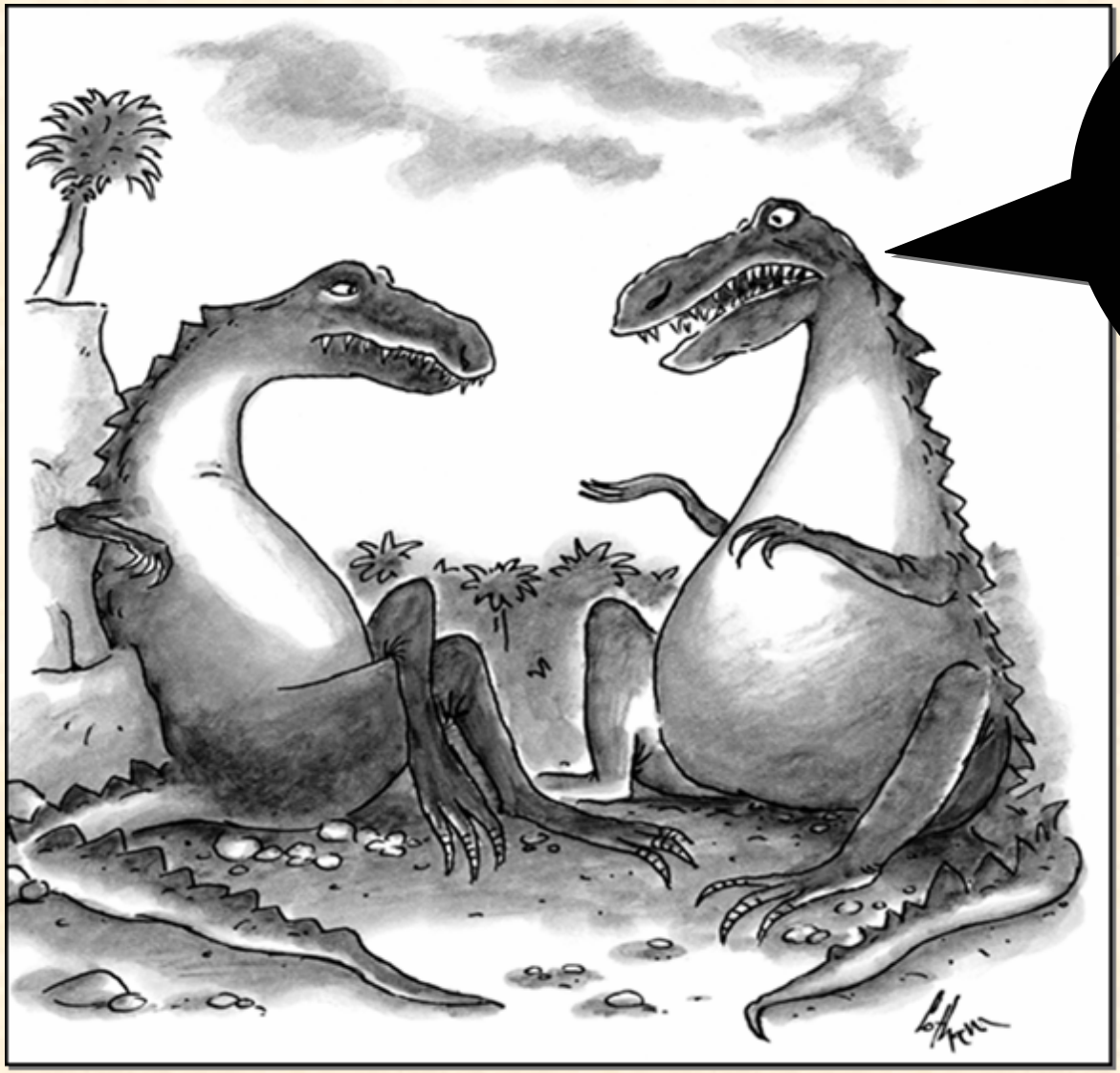

End

Oak Ridge National Laboratory and the University of Tennessee

Technology for Today and the Future

John C. Doesburg
Associate Vice President for Research, University of Tennessee
Director, Homeland Security Programs, Oak Ridge National Laboratory
Director, UT-ORNL Center for Homeland Security

June 2006
Oak Ridge, Tennessee


"All I'm saying is, now is the time to develop the technology to deflect an asteroid."

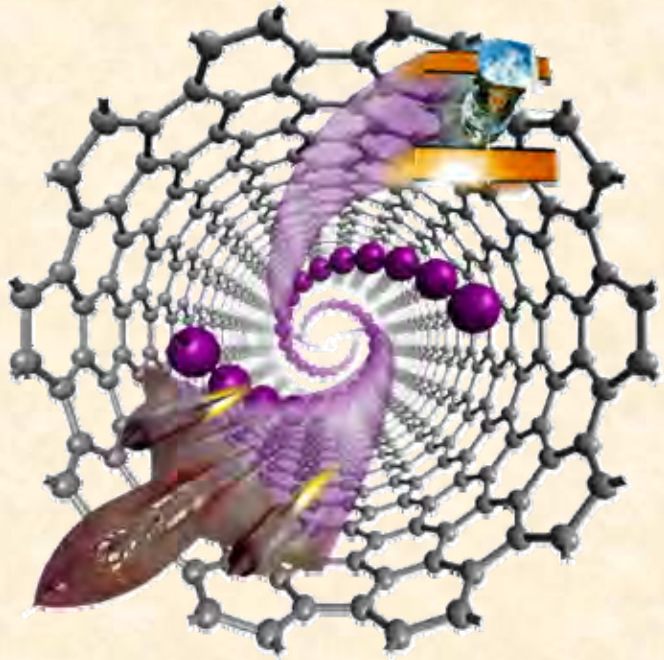
Today, ORNL is DOE's largest multipurpose science laboratory



- **$1.08 billion budget**
- **4,000 employees**
- **3,000 research guests annually**
- **Nation's largest unclassified scientific computing facility**
- **Nation's largest science facility: the $1.4 billion Spallation Neutron Source**
- **Nation's largest concentration of open source materials research**
- **Nation's largest energy laboratory**
- **$300 million modernization in progress**

Our aspiration:
Best lab in the world at what we do

- **Control of functionality at the nanoscale**
- **Leadership-class computing for the frontiers of science**
- **Integration of biology and ecology, based on the foundation of understanding molecular-level interactions**
- **Integration of science, technology, and thought leadership for energy**
- **Innovative solutions that improve national, homeland, and global security**



We have significant strengths in key areas

Radiological and nuclear weapons countermeasures

- **RDD attribution studies, forensics program development, and decontamination of the aftermath**
- **Active interrogation technologies**
- **Radiation detection technologies and new materials**

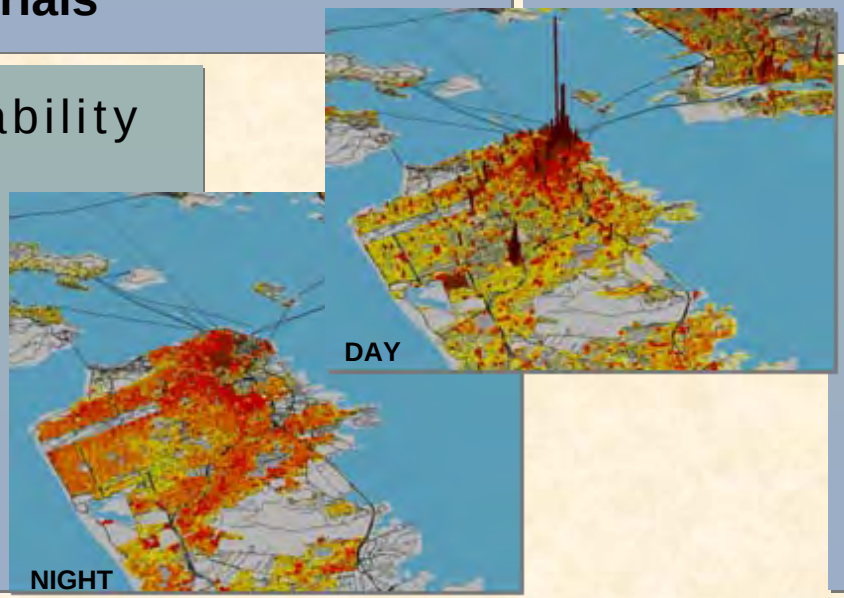
Chemical and biological

- **Mass spectrometry**
- **Bioinformatics**
- **Host-pathogen interactions**



Threat vulnerability testing and assessment

- **Geospatial science**
- **Plume/effect modeling**
- **Cybersecurity technology**



Crosscutting

- **Sensor technologies**
- **Knowledge discovery**



Significant advances in sensors and detectors

Block II Chemical-Biological mass Spectrometer Detector





Microcantilever sensors for detection of explosives and chemicals



AquaSentinel for water supply protection



RAMiTS for detection of chemical agents and other hazardous chemicals



Biochip for detection of bacteria, viruses, and toxins

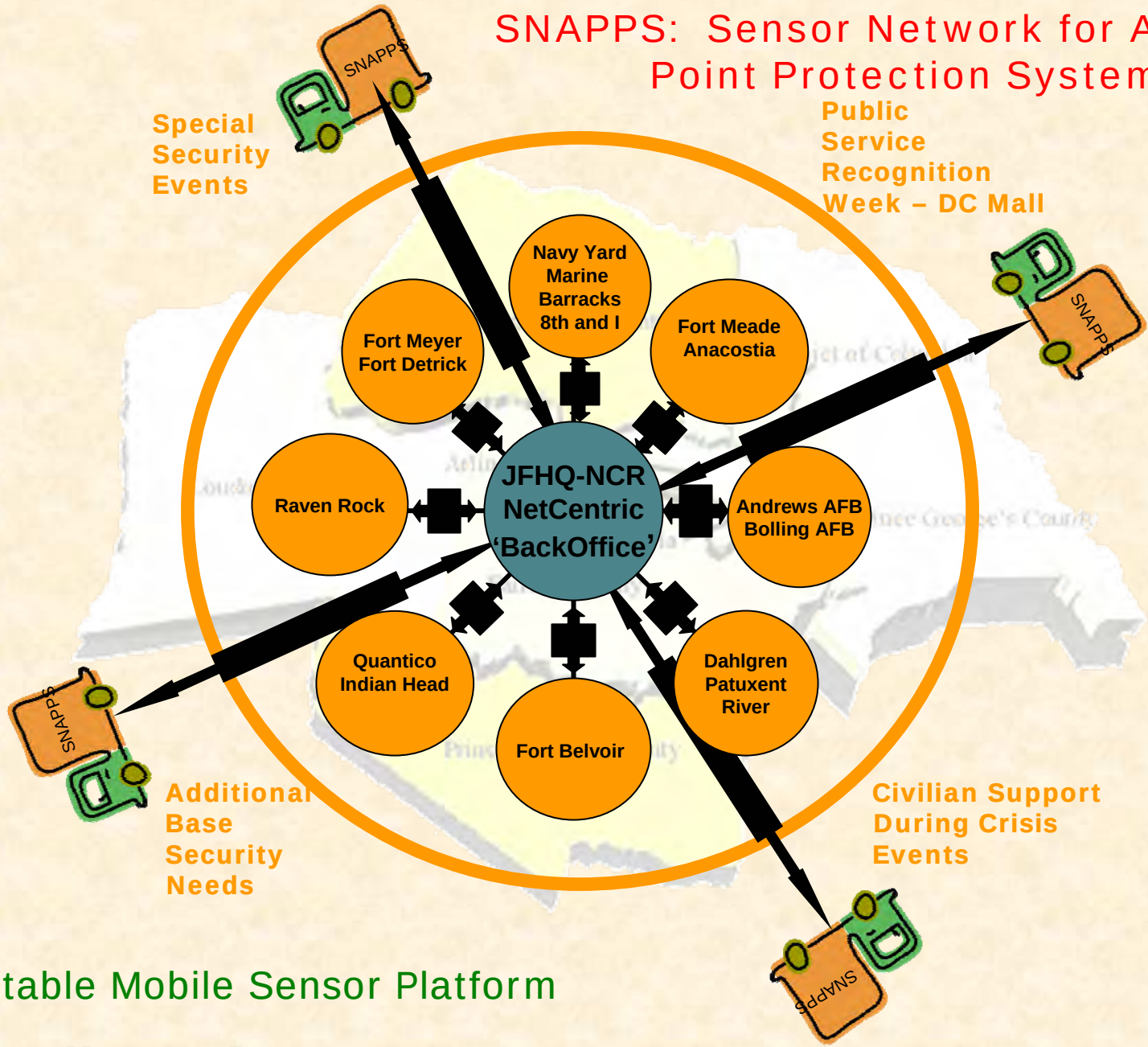


Forward Area Semi-Autonomous Robotic Tactical Detection & Decontamination



Advanced Technology Assessment

SNAPPS: Sensor Network for Area and Point Protection System



Re-locatable Mobile Sensor Platform

National Institute of Standards and Technology
Technology Administration
U.S. Department of Commerce

Summer Workshop
Net-Ready Sensors: The Way Forward

What: The National Institute of Standards and Technology (NIST), the Joint Program Executive Office, Chemical and Biological Defense (JPEO-CBD), and Oak Ridge National Laboratory (ORNL) are sponsoring a two-day workshop on "Net-Ready Sensors: A Way Forward."

Where: ORNL's campus in **Oak Ridge, Tennessee**

When: August 2-3, 2006

The Net-Ready Sensors Workshop will provide an opportunity for developers and subject matter experts to share their interests in the DoD's development of **net-centric CBRN sensor architectures**. This will be an unclassified workshop. The agenda will include presentations and discussions on plug and play standards for sensor networks, sensor data standards, commercial offerings for net-centric sensor applications, and sensor network research.

The Workshop organizers are David Godso, of JPEO-CBD, Bryan Gorman, of ORNL, and Kang Lee, of NIST.

Interested parties wishing to participate in the workshop should contact one of the organizers (see below) by 1 July 2006. Attendance will be limited to 40 participants.

Contact Information

Dave Godso
godso@spawar.navy.mil
703.989.0779

Bryan Gorman
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865.576.4241

Kang Lee
kang.lee@nist.gov
301.975.6604

Knowledge Discovery from Text: A Success Story

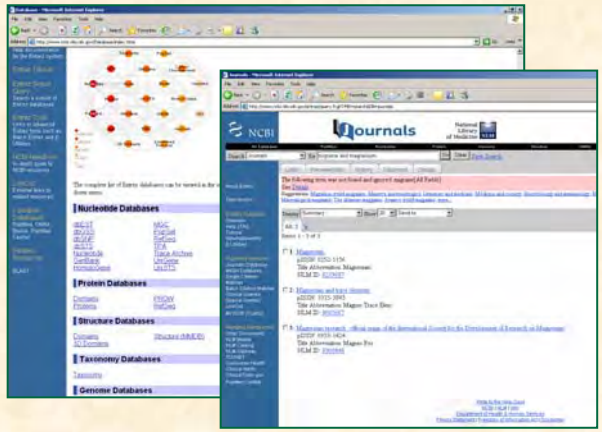
Biomedical Journals

Low Cross-reference within disciplines



PubMed Archives

Online Archive of Medical Journals



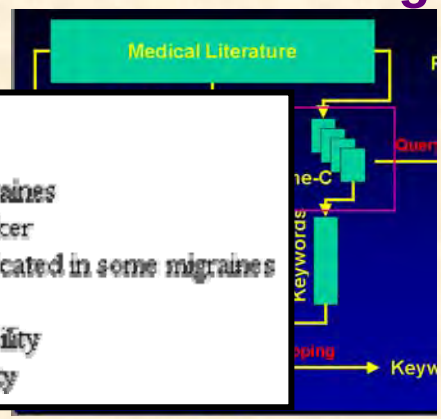
Question:

What causes migraine headaches?

Text Analysis and Mining

Extracted evidence from titles of articles in the biomedical literature

- stress is associated with migraines
- stress can lead to loss of magnesium
- calcium channel blockers prevent some migraines
- magnesium is a natural calcium channel blocker
- spreading cortical depression (SCD) is implicated in some migraines
- high leveles of magnesium inhibit SCD
- migraine patients have high platelet aggregability
- magnesium can suppress platelet aggregability



Swanson, 1987
Swanson et al., 1991, 1994, 1997

Example from Hearst, 1999

New Hypothesis:

Magnesium Deficiency leads to Migraine

(**New** medical knowledge)



Ramadan et al., 1989

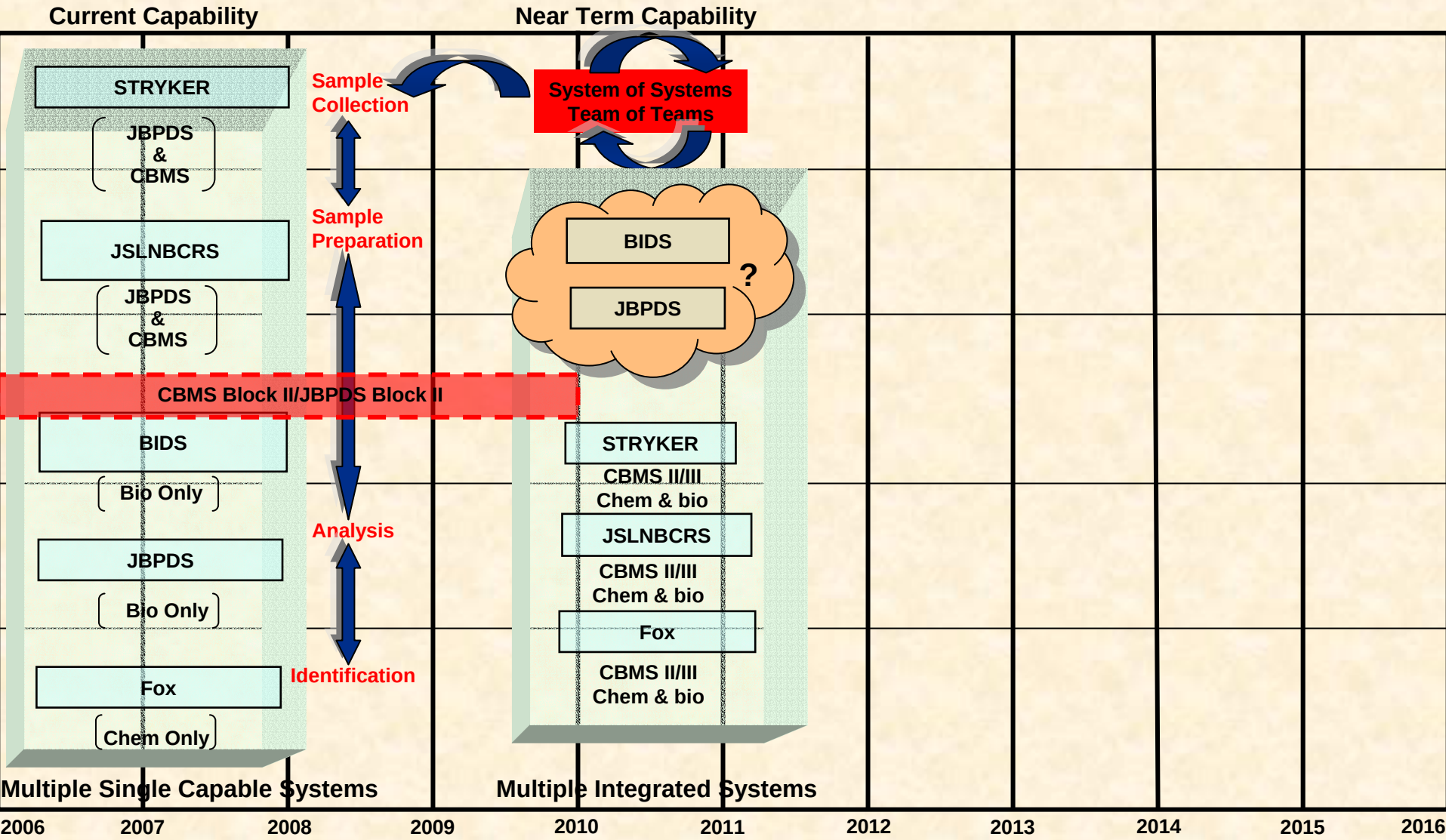
Confirmed by Experts

Hypothesis Generation: ***"Chains of causal implication within the medical literature can lead to hypotheses for causes of rare diseases"***

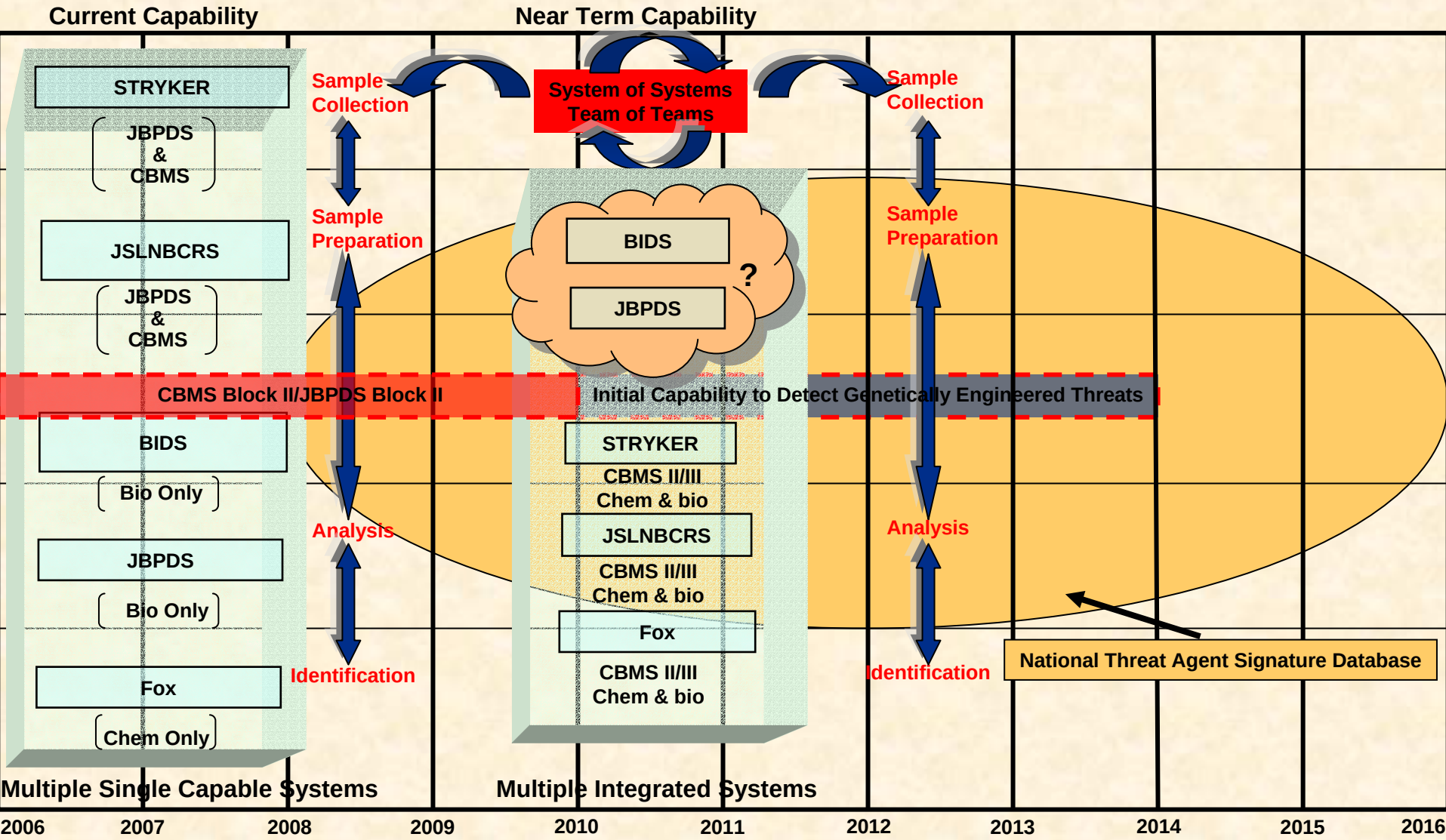
Pursuing The Challenges of The Future - Detection of Genetically Modified Organisms

- **A System of Systems approach to the detection of chemical and biological agents with a focus on genetically engineered organisms (GMOs)/genetically engineered threats (GETs)**
  - **A true National/Grand Challenge – could be the Manhattan Project for the21st Century**
- **Pulling together world-class researchers, Oak Ridge National Laboratory and UT faculty**
- **ORNL Laboratory Agenda Item – significant laboratory directed research and development (LDRD) funding**

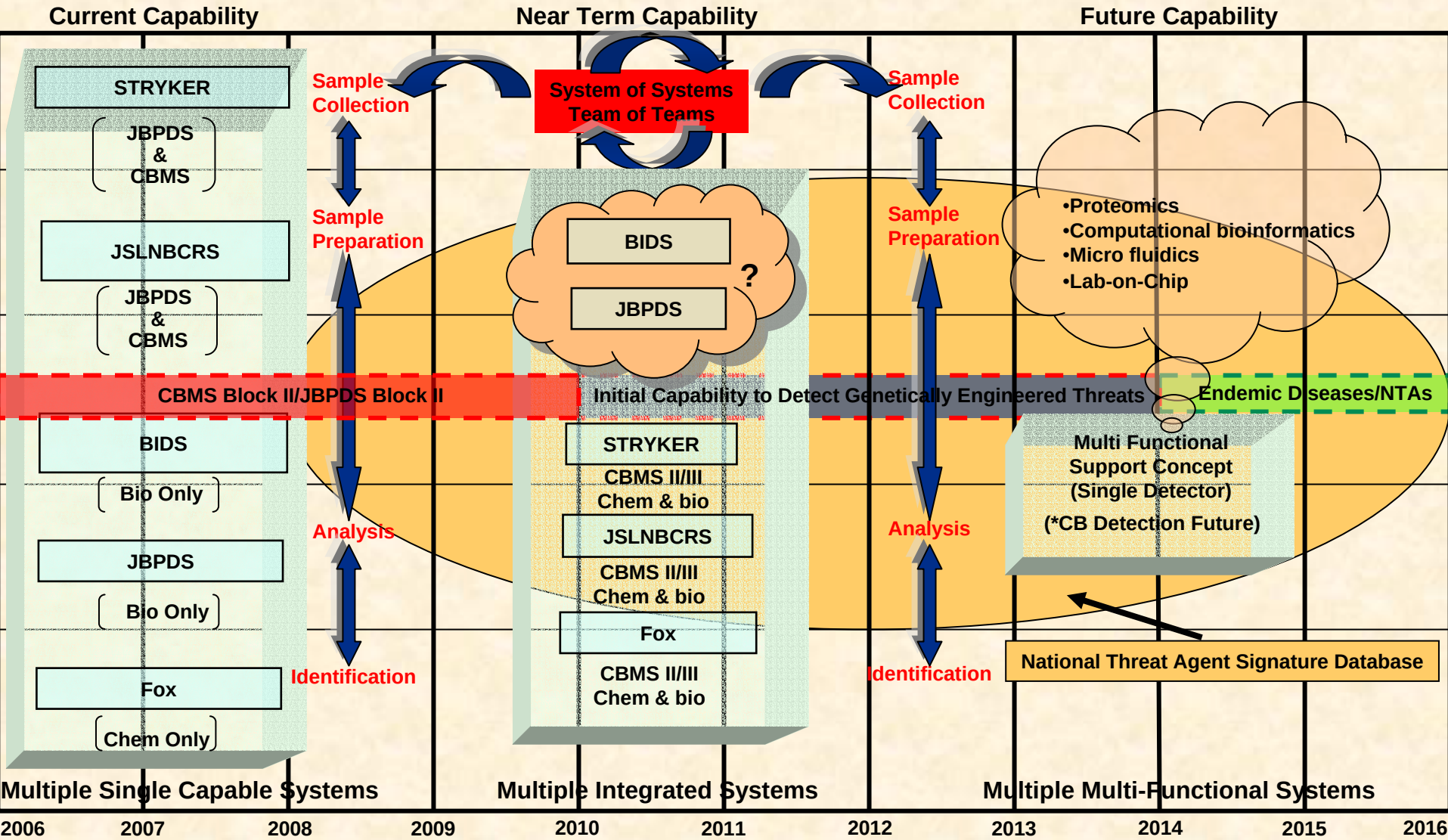
Strategic Roadmap for Genetically Engineered Threat Detection



Strategic Roadmap for Genetically Engineered Threat Detection



Strategic Roadmap for Genetically Engineered Threat Detection





“Imagination is more important than knowledge …”

“The important thing Is not to stop questioning …”

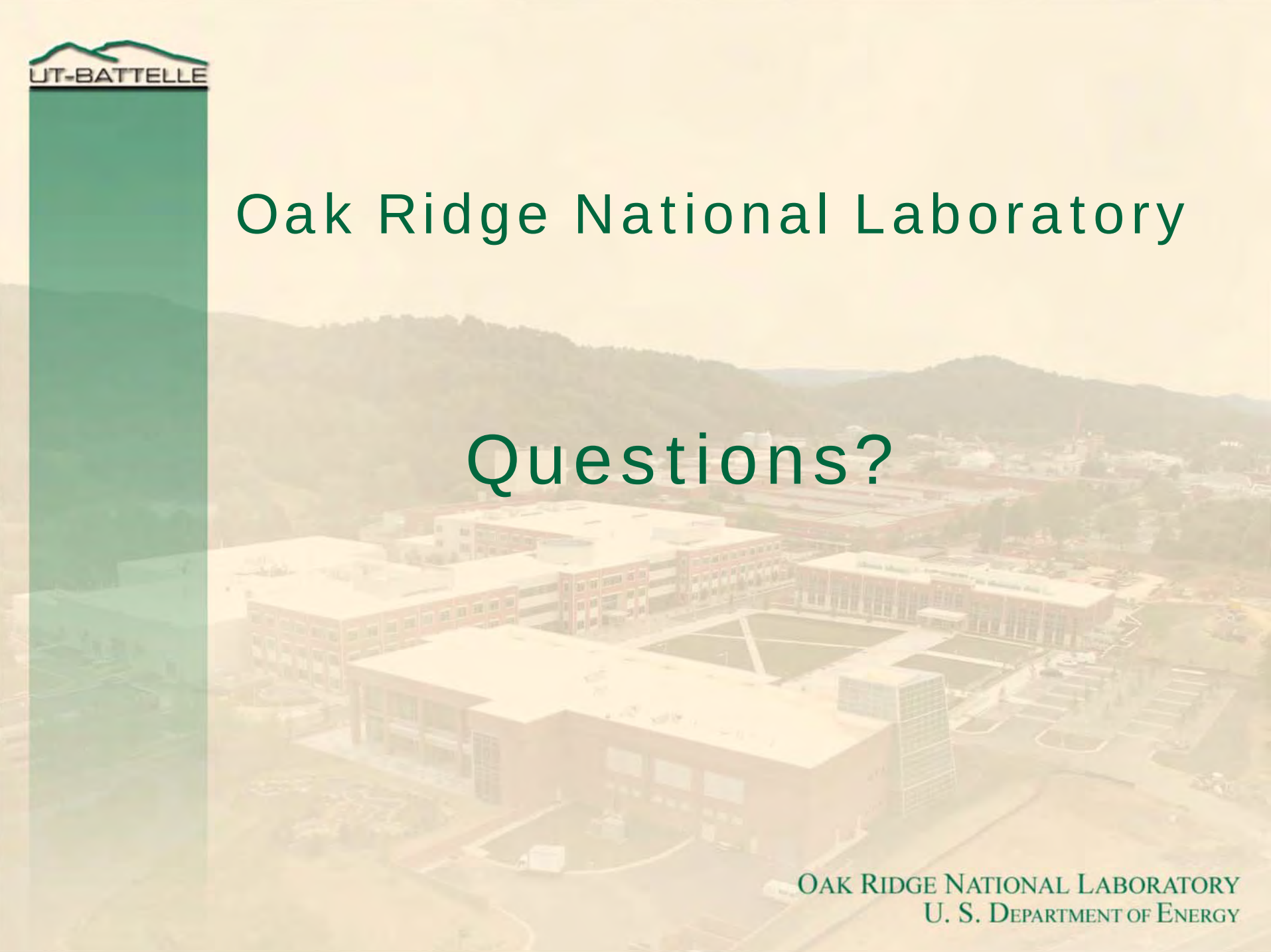
“If we knew what it was we were doing, it wouldn’t be called research, would it?”

Albert Einstein

UT-BATTELLE

Oak Ridge National Laboratory

Questions?



OAK RIDGE NATIONAL LABORATORY
U. S. DEPARTMENT OF ENERGY

Battelle
The Business of Innovation

Joint CBRN Conference Technology Panel

BG (Ret) Dean Ertwine

28 June 2006

TECHNOLOGY – The Competition

Global R&D Spending

Country	GDP 2004	R&D as % GDP	R&D 2004	R&D 2005	R&D 2006
U.S.	11,200	2.7	302	312	321
China	7,262	1.5	109	125	140
Japan	3,745	3.2	120	123	126
India	3,319	1.4	46	53	58
France	1,981	2.2	44	44	45
Germany	2,362	2.2	52	53	54
UK	1,782	2.0	36	37	38

Billions $

Source: R&D Magazine, Battelle, OECD, World Bank

TECHNOLOGY – The Competition

Sources of R&D Funding

Country	Industry (%)	Government (%)	Academia (%)	From Abroad (%)
U.S.	61.2	31.3	7.3	-
China	57.6	33.4	6.3	2.7
Japan	73.9	18.2	7.5	0.4
India	23.0	74.7	2.3	-
France	52.1	38.4	1.5	8.0
Germany	65.4	31.9	.4	2.3
UK	46.7	26.9	5.9	20.5

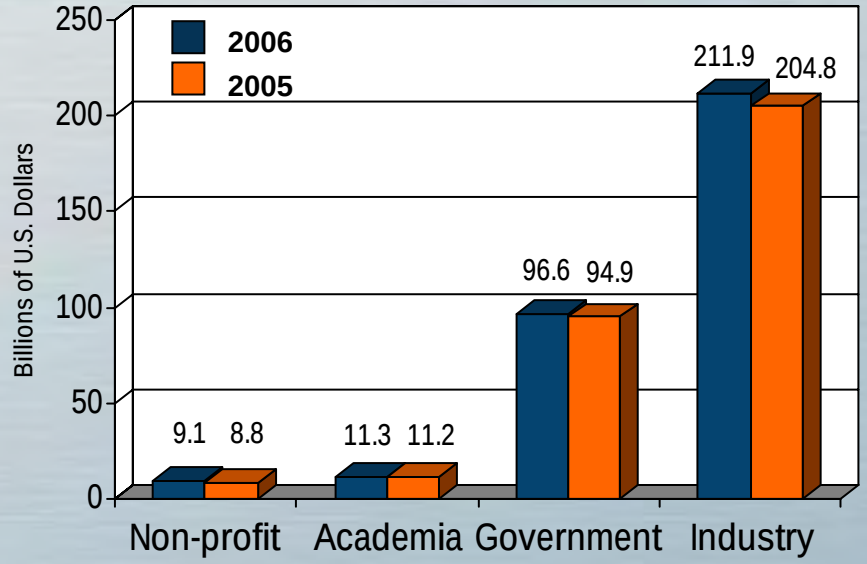
Source: R&D Magazine, Battelle, UNESCO

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The Business of Innovation

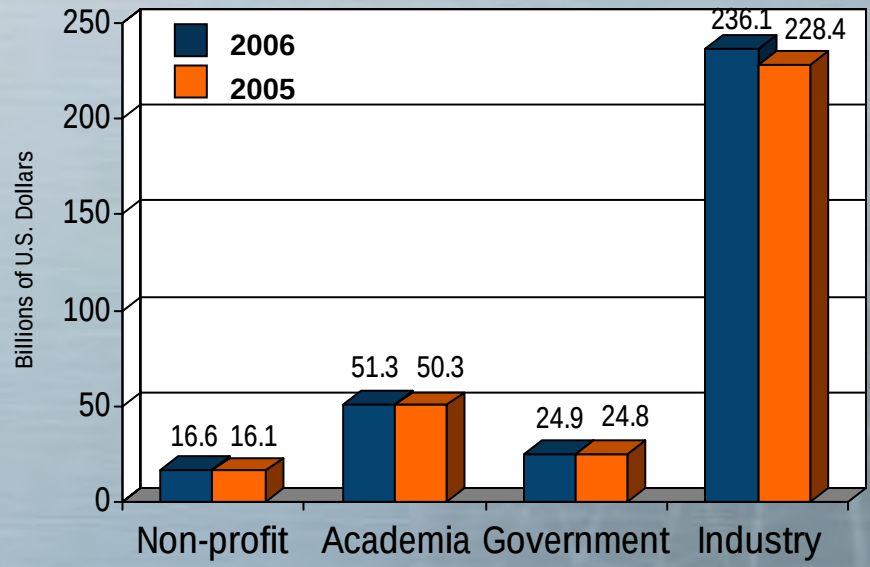
TECHNOLOGY – U.S. R&D Funding

- U.S. funding is forecast to increase 2.9% in 2006 to $329 billion.
- Two-thirds of all R&D is driven by the industrial sector, which rises 3.5%.
- Globalization, the federal deficit, and staffing will affect future funding.
- Growth of defense R&D funding has slowed and will likely reverse.
- Ratio of Development/Research continues to increase

U.S. R&D Funding Sources



U.S. R&D Execution

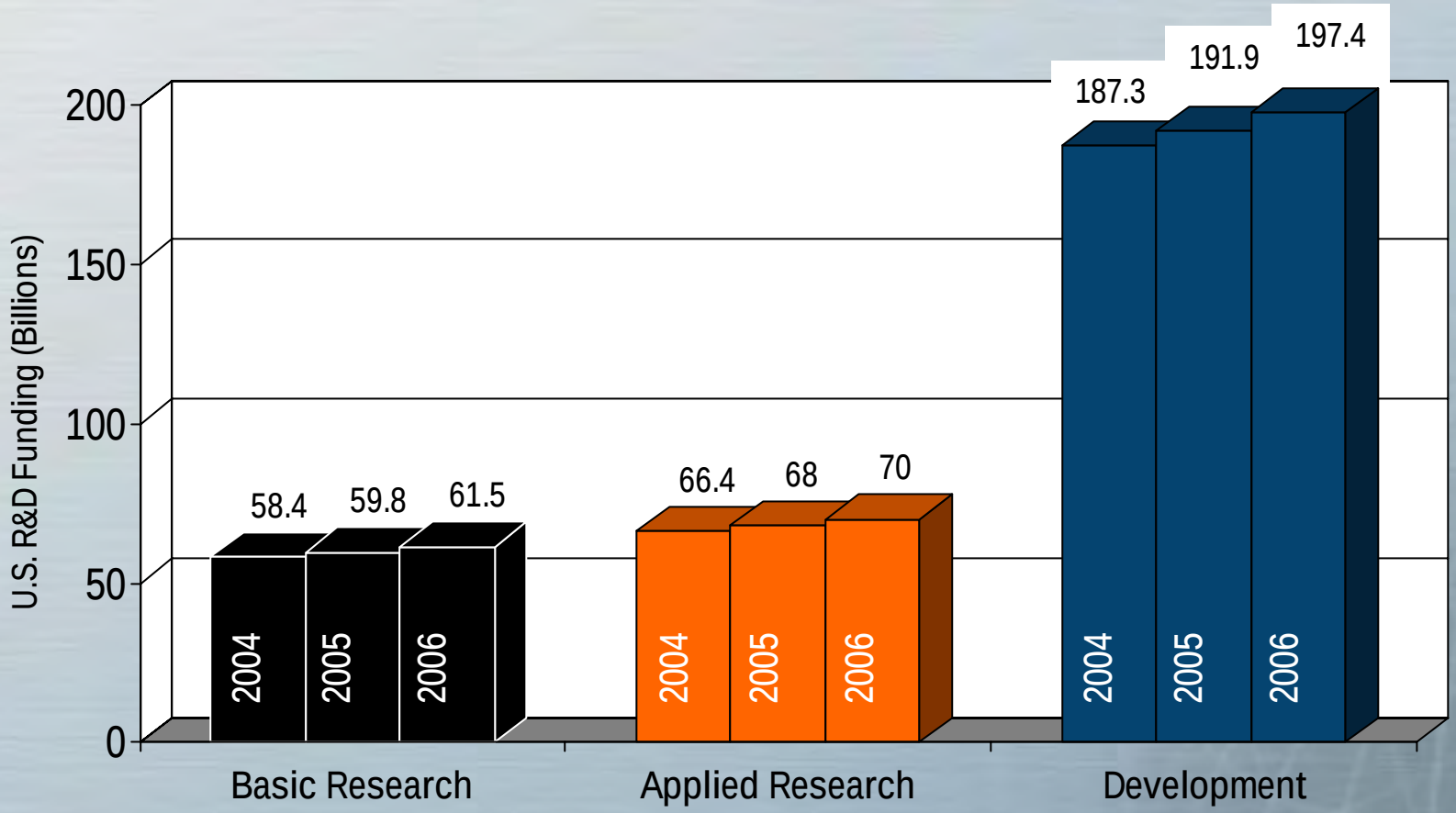


Source: Battelle, R&D Magazine

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The Business of Innovation

TECHNOLOGY – Big “D”, Little “R”

Increasing Trend to Development



Source: NSF, R&D Magazine

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The Business of Innovation

TECHNOLOGY – Federal R&D Appropriations

Government Agency	FY2005	FY2006	Change
Dept. of Defense	71.566	73.039	2.1%
Health and Human Services	29.084	29.023	-0.2%
NASA	10.705	11.367	6.2%
Dept. of Energy	8.614	8.608	-0.1%
National Science Foundation	4.057	4.123	1.6%
U.S. Dept. of Agriculture	2.403	2.394	-0.4%
Dept. of Homeland Security	1.243	1.281	3.1%
Dept. of Commerce	1.148	1.131	-1.5%
Dept. of Transportation	0.744	0.841	13.0%
Dept. of Veterans Affairs	0.784	0.805	2.7%
Dept. of Interior	0.615	0.629	2.2%
Environmental Protection Agency	0.572	0.573	0.2%
Dept. of Education	0.297	0.258	-13.0%
All Other	0.727	0.692	-4.8%
Total	**132.560**	**134.765**	**1.7%**

Source: AAAS (Billions $)

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The Business of Innovation

TECHNOLOGY – Federal 2006 R&D Highlights

- DOD initially requested an overall cut in FY06 – Congress provided $1.5B increase (+2.1%)
- DOD appropriation contains a 1% rescission for all previously approved R&D appropriations
- DOD projections reveal 10% cut through FY09
- DOE programs were cut 0.4% in FY06. Support for some science–user facilities was cut as much as 60%
- DHS R&D budget increases 3.1% to $1.3B.
  - $210M for Rad/Nuc countermeasures (+71%)
  - $376M for Biological countermeasures (+3.7%)

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The Business of Innovation

TECHNOLOGY – Issues

- Impact of anticipated federal deficit on discretionary R&D spending
- Increasing shift from research funding to development funding
- The rise of international R&D competitors
- Evidence that U.S. educational system is not producing the necessary talent for competitive R&D

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The Business of Innovation

TECHNOLOGY – Panel Members

- DOE — MG (Ret) John Doesburg
  Director, Homeland Security Programs, ORNL
  Assoc. VP for Research, Univ. of Tennessee
- DHS S&T — Dr. Jeff Stiefel
  PEO for Chem-Bio Security Programs
- DTRA — COL Ben Hagar
  Deputy, Joint S&T Office for Chem-Bio Defense
- JPEO-CBD — Mr. Ed Wack
  Director, Future Acquisition

Chemical Biological Defense Program Science & Technology

A Look to the Future

Dr. Chuck Gallaway

Chemical Biological Defense Program (CBDP)
Joint Science & Technology Office (JSTO)

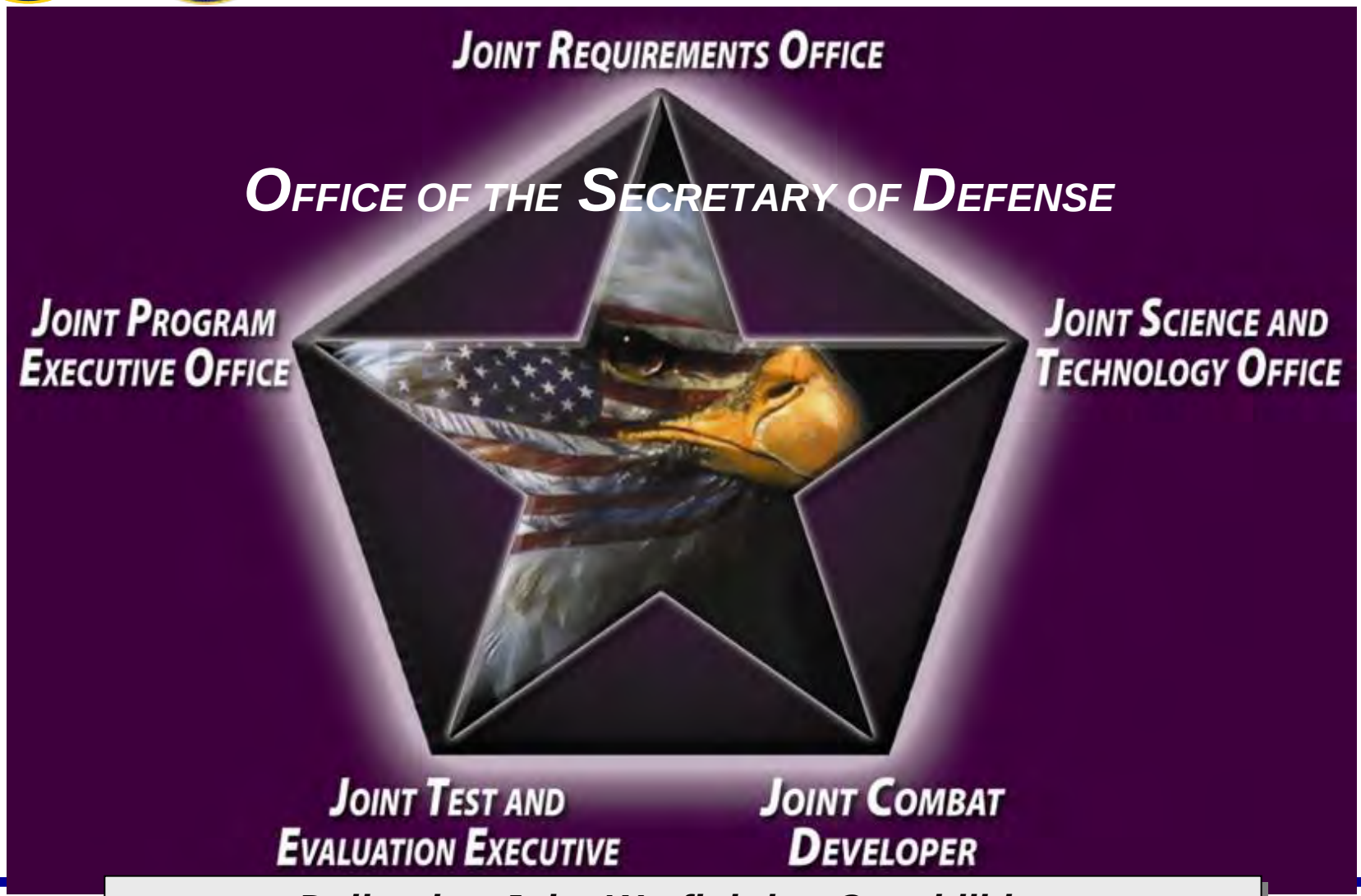
Defense Threat Reduction Agency (DTRA)
Chemical/Biological Technologies Directorate

28 June 2006

Overview

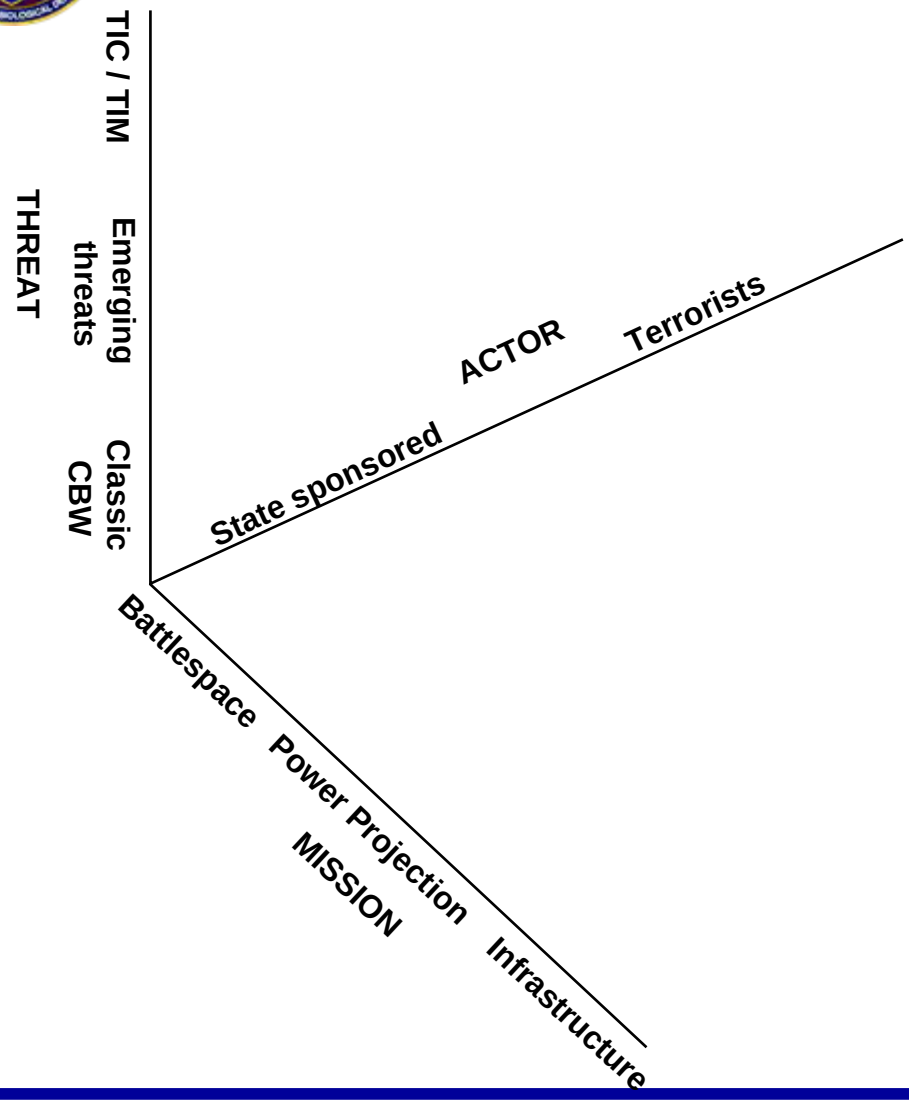
- Background
- Business strategy
- The S&T challenges
- Sustaining S&T
- Conclusions

We are the S&T arm of the CBDP



Delivering Joint Warfighting Capabilities

The CB threats and CBDP mission space are expanding



Our S&T …

Vision

Eliminate chemical and biological warfare agents as a threat to the warfighter

Mission

Develop and sustain a robust, agile, and flexible science and technology program to support chemical and biological defense capability needs

We are organized by capability areas

Medical Science & Technology

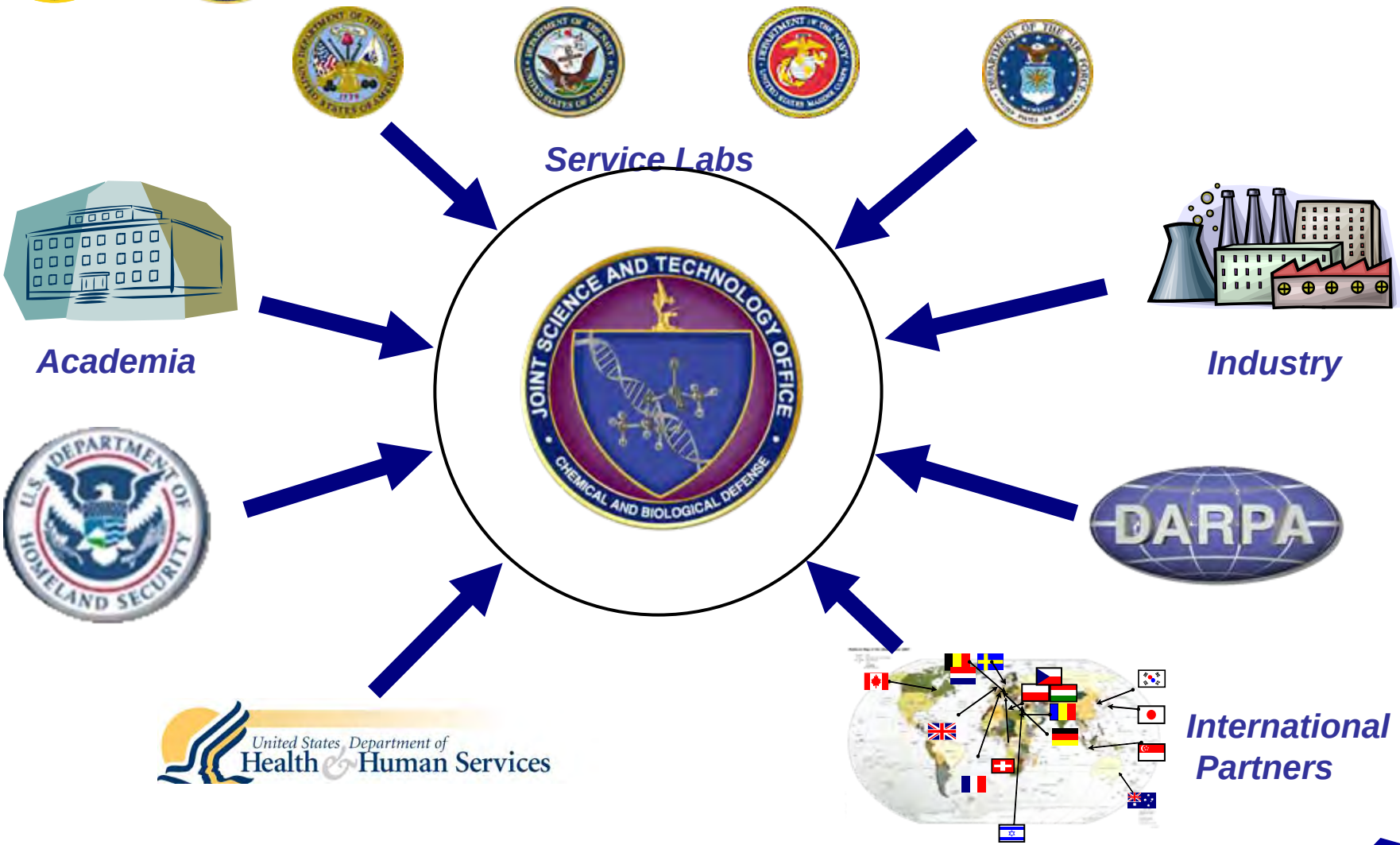
- Pretreatments
- Therapeutics
- Diagnostics
- Emerging Threats
- Medical Radiological Defense
- TMTI

Physical Science & Technology

- Detection
- Protection
- Decontamination
- Modeling & Simulation
- Threat Agent Science

Applied Technology

Leveraging the best in class from across the spectrum of performers



Overview

- Background
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CBDP S&T is…

- Technically challenging
  - Exceedingly high customer expectations
  - No "silver bullet" solutions
- Scientifically diverse
  - Numerous and disparate disciplines
  - Distinct chemical and biological solutions

DoD has placed significant emphasis on RDT&E

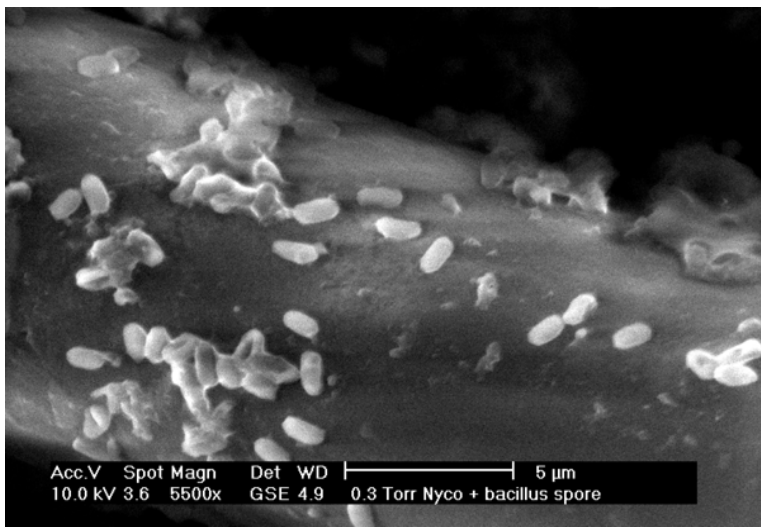
- Enhanced Planning Process (EPP)
- Quadrennial Defense Review (QDR)
- OSD FY08-FY13 POM guidance

QDR - Countering WMD remains a DoD priority

- Future program direction
  - "…fund a $1.5 billion initiative over the next five years to develop broad-spectrum medical countermeasures against the threat of genetically engineered bio-terror agents."
  - "Additional initiatives will include developing advanced detection and deterrent technologies and facilitating full-scale civil-military exercises to improve interagency planning for complex homeland security contingencies."
- Form domestic and international partnerships
  - "Close cooperation with these partners in the long war on terrorism, as well as in efforts to counter WMD proliferation and other non-traditional threats, ensures the continuing need for these alliances and for improving their capabilities."
  - "…establishment of a National BioDefense Campus at Fort Detrick, Maryland – with the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the Defense Intelligence Agency's Armed Forces Medical Intelligence Center (AFMIC) at its core – to improve cooperation among agencies conducting research and development of medical biological defenses."
- Need for high quality personnel
  - "Finally, the Department must effectively compete with the civilian sector for high-quality personnel. … a new Human Capital Strategy for the Department,…"

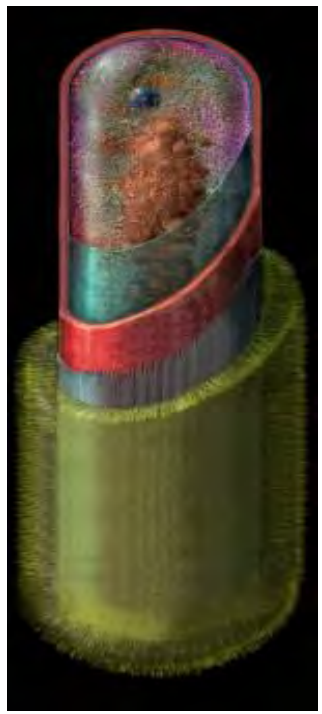
S&T investment strategy

- Fully fund highest priority S&T gaps
- Burdensharing
- Technology watch



BG Spores collecting on an anti-microbial fiber

Anthrax cell



Plasmid

Cytoplasm+RNA +Proteins

DNA

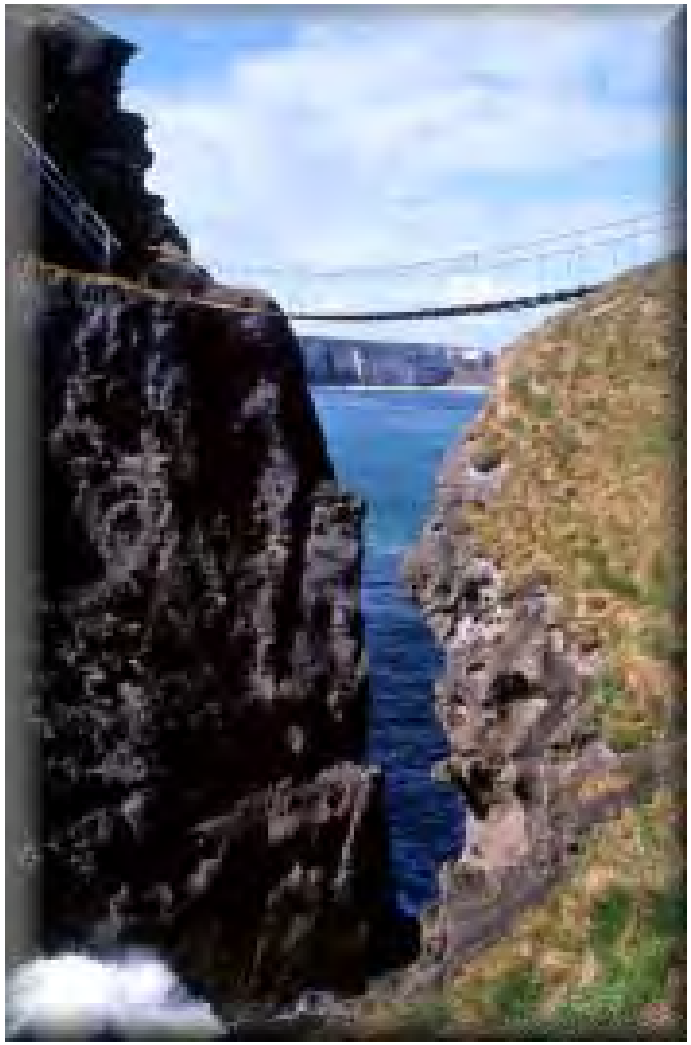
Plasma Membrane

Cell Wall

S-Layer (proteins)

Capsule (poly-D -glutamic acid)

Supporting programs of record



Bridging the “valley of death” between S&T and advanced development

- Evolutionary advancements align w programs of record
- 35 Technology Transition Agreeme
- Relatively low risk technology

Shift towards revolutionary improvements

- New science
- Interdisciplinary teams
- Non-traditional performers
- Risk tolerant

a carbon sphere doped with a reactive nanoscale metal oxide component





a nanofibrous web surface-coated with a nanoscale adsorbent + catalyst

Overview

- Background
- Business strategy
- The S&T challenges
- Sustaining S&T
- Conclusions

Our S&T challenges

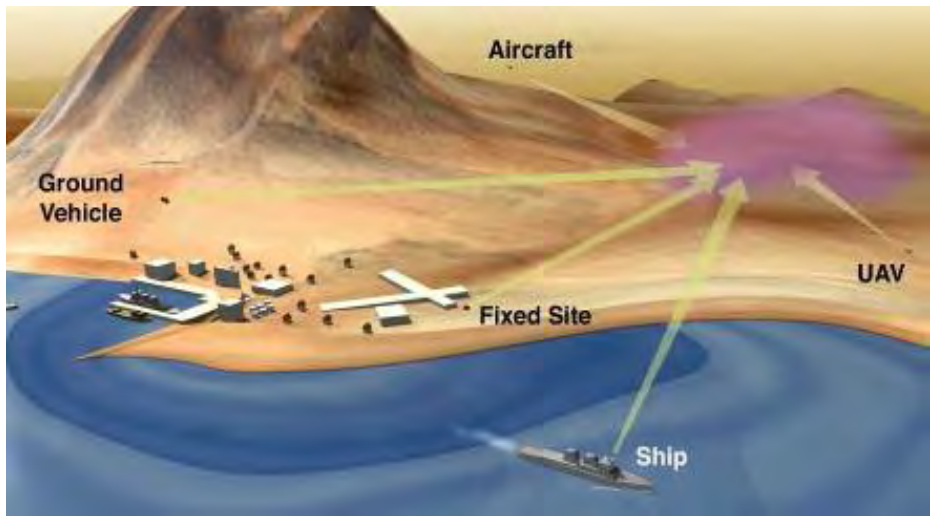
- Earliest warning
  - Detection
  - Medical diagnostics
  - Information dissemination

- Broad spectrum medical countermeasures
  - Pretreatment
  - Therapeutics

- “How clean is safe?”
  - Decontamination
  - Low-Level toxicology
  - Environmental fate of agent

Detection

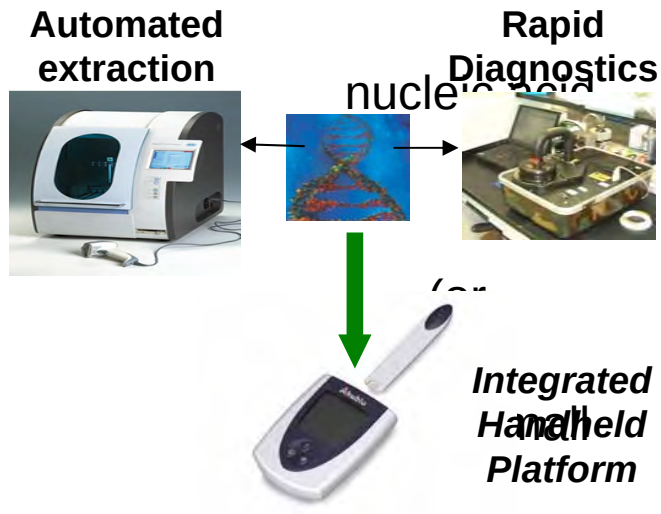
- Current Efforts
  - Explore terahertz spectroscopy for detection
  - Investigate laser-induced millimeter wave fluorescence for better bio discrimination
  - Exploit Semiconductor Ultra Violet Optical Sources (SUVOS) being developed by DARPA for the detection of bio agent aerosols.
- Challenges
  - Signatures from “non-traditional” regions of the electromagnetic spectrum
  - Techniques and algorithms for discriminating signatures from a complex background



Detect and identify biological threats at standoff distances

Diagnostics

- Current Efforts
  - Developing nucleic acid and antigen detection assays and reagents
  - Assessing resequencing technology for rapid identification of emergent/genetically engineered bio agents
  - Establishing standards for DoD developed and immunodiagnostic assays
- Challenges
  - Biological sample viability at room temperature above) for up to seven days
  - Integrated platform for nucleic acid, protein molecule toxin diagnostics
  - Simple, small, and integrated sample processing and testing platforms
  - Assays for early (pre-symptomatic) markers of exposure
  - Rapid diagnostic tests to identify antibiotic resistance markers

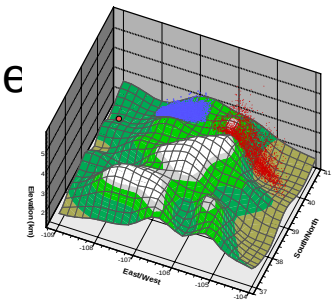


Portable and deployable diagnostic capabilities, easy to operate, and with minimal logistical requirements

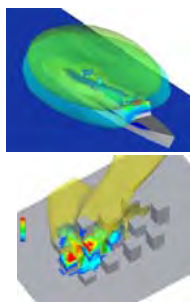
Battlespace Awareness

- Current Efforts
  - Developing computational fluid dynamic (CFD) libraries for a particle transport model to provide rapid and high resolution analysis around buildings and ships
  - Developing techniques to use high-resolution radar data to improve wind fields for models
  - Providing automatic source term estimation using data from either sensors or observations
- Challenges
  - Intelligent “network centric” sensor arrays
  - Improved CBRN hazard prediction on comple urban terrain

CFD Model



Ship and Urban Visualization



Reliable, automated warning in a common operating picture across the theater

Our S&T challenges

- Earliest warning
  - Detection
  - Medical diagnostics
  - Information dissemination

- Broad spectrum medical countermeasures
  - Pretreatment
  - Therapeutics

- “How clean is safe?”
  - Decontamination
  - Low-Level toxicology
  - Environmental fate of agent

Pretreatments

- Current Efforts
  - Evaluating select target antigens in various vaccine platforms for immunogenicity, safety, efficacy, and minimal dosing
  - Combining current products into one
  - formulation for a straight recombinant vaccine (multiagent vaccines)
  - Evaluating molecular/genetic platforms

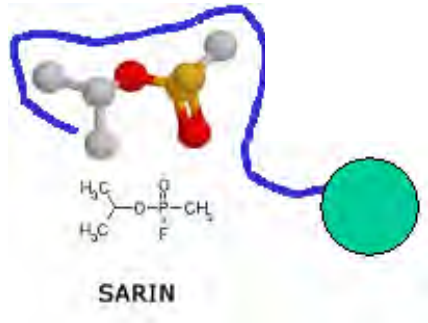


- Challenges
  - DNA platforms for rapid vaccine development
  - Vaccines that are adaptable to emerging threats
  - Better understanding of human immune mechanisms
  - Broad spectrum medical prophylaxis and countermeasures against all nerve agents

Single vaccines against multiple biological agents
Rapid drug development

Therapeutics

- Current Efforts
  - Identifying intersecting targets for intervention including common mechanisms of pathogenesis, common host responses, common housekeeping functions
  - Identifying and characterizing a candidate broad-spectrum nerve agent reactivator to replace the current reactivator (oxime) in nerve agent therapy
- Challenges
  - Broad spectrum therapeutics for diverse/emerging threats
  - New technologies and methods to accelerate FDA licensure of new products
  - Minimal systemic, neurological, ocular, and cutaneous injury due to chemical threat agent exposure
  - Develop novel new interventions/approaches
  - Leverage and adapt technologies developed for other purposes

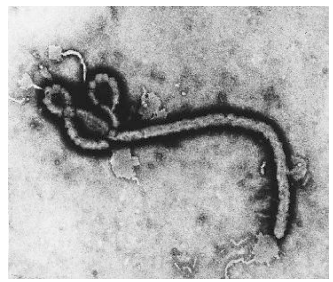


Nuclease-Resistant
DNA Aptamers with 3'-Caps
Bind & Neutralize
G & V Agents

Effective countermeasures against bio warfare agents
Multi-agent therapeutic technologies

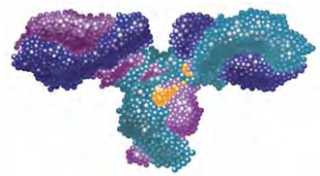
Transformational Medical Technologies Initiative (TMTI)

- Current Efforts
  - TMTI goal is to conduct vigorous medical research to develop broad-spectrum medical countermeasures against emerging biological threat agents
  - Program targeted for countermeasures against two classes of agents: Hemorrhagic fever viruses and Intracellular bacterial pathogens
  - TMTI offerors announced; contracts to be awarded



- Challenges
  - Identify & leverage most promising technologies in the development pipeline for rapid transition to advanced development
  - Develop counter-measure products that are regulatory compliant, robust, and highly effective at a reasonable cost.





TMTI represents a novel technology and acquisition experiment

Our S&T challenges

- Earliest warning
  - Detection
  - Medical diagnostics
  - Information dissemination

- Broad spectrum medical countermeasures
  - Pretreatment
  - Therapeutics

- "How clean is safe?"
  - Decontamination
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Decontamination

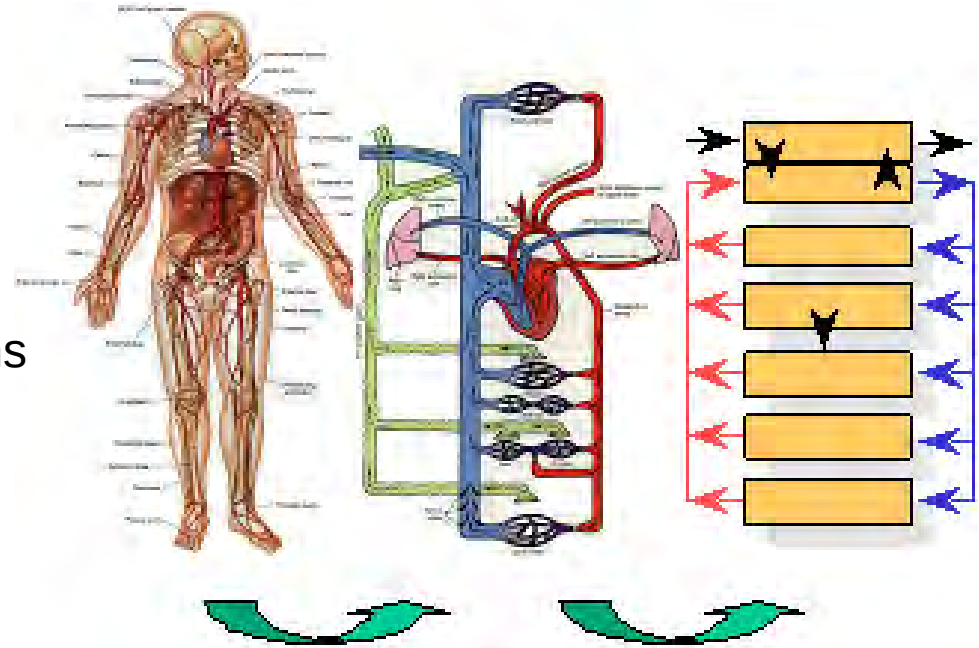
- Current Efforts
  - Modeling quantum-chemical agent/adsorbent Interactions
  - Studying surface chemistry of vaporous H_2O_2 and ClO_2
  - Developing solvent soluble decontaminating enzymes
  - Aerosolizing activated H_2O_2 for decontamination of aircraft interiors
- Challenges
  - Removal or detoxification of chemical agents bound in porous matrices
  - Smaller quantities and fewer varieties of decontaminants required
  - Detection of residual agent on surface and vapors below toxicological thresholds to validate successful decon in the field



Effective, non-corrosive decontaminants for sensitive equipment, vehicles, and building interiors

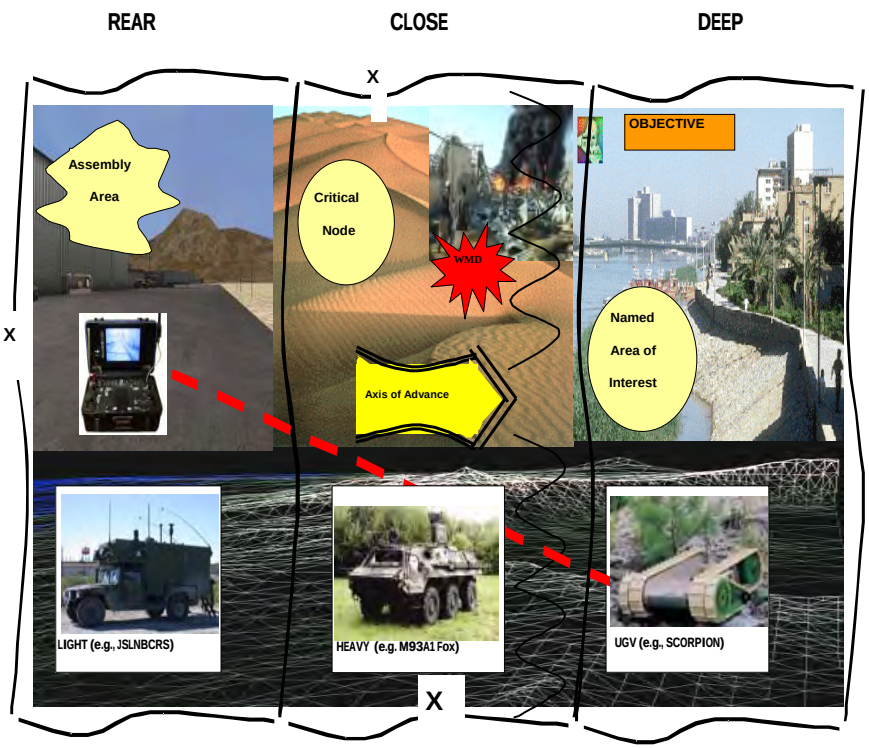
Threat Agent Science

- Current Efforts
  - Studying toxicological effects low levels of exposure to agents
  - Researching environmental fate of agent
- Challenges
  - Better fundamental understanding of CB agents
    - Physical and chemical properties
    - Fundamental interactions with other materials and environment
    - Pathological and toxicological properties
    - Exploitable signatures

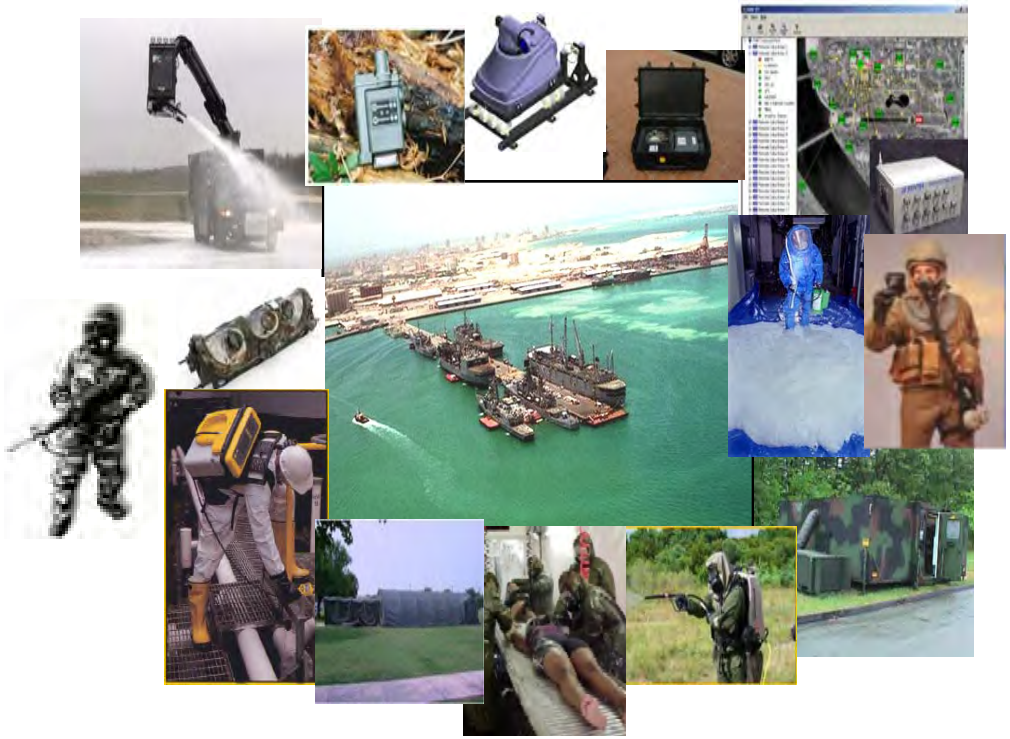


Improved CONOPS and a better understanding of CB-relevant science

Technology integrated through joint experimentation



Chemical Biological Radiological Nuclear Unmanned Ground Reconnaissance (CUGR) ACTD



Contamination Avoidance at Seaports of Debarkation (CASPOD)

Overview

- Background
- Business strategy
- The S&T challenges
- Sustaining S&T
- Conclusions

Sustaining and improving S&T capability

- Intellectual capital
- Physical infrastructure







Overview

- Background
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- Conclusions

We are…



- Improving business strategy
- Bridging the “valley of death” between S&T and advanced development
- Emphasizing revolutionary technology
- Sustaining and improving S&T capability

Joint Combat Developer





Presented to:
Joint CBRN Conference
By
BG Lillie
Commandant, USACLMS

Agenda

- **Role of the Joint Combat Developer**
- **Mission**
- **Organization**
- **Chartered Work**
  - **Joint Experimentation and Analysis**
  - **Joint Threat Support**
- **DOTMLPF support to the CBDP**
- **Transforming to meet the Combatant Commanders Needs**

Role of the Joint Combat Developer

CBDP Program Process & Organization

OSD provides oversight

- Combatant Commanders
- Services



Joint Combat Developer

Joint Requirements Office (JRO)

Required Capabilities

JFOCS

Prioritized Needs

Test & Evaluation

S&T Gaps

Joint Science & Technology Office DTRA/CB

Joint Program Executive Office (JPEO)

Mature Technologies

Solutions



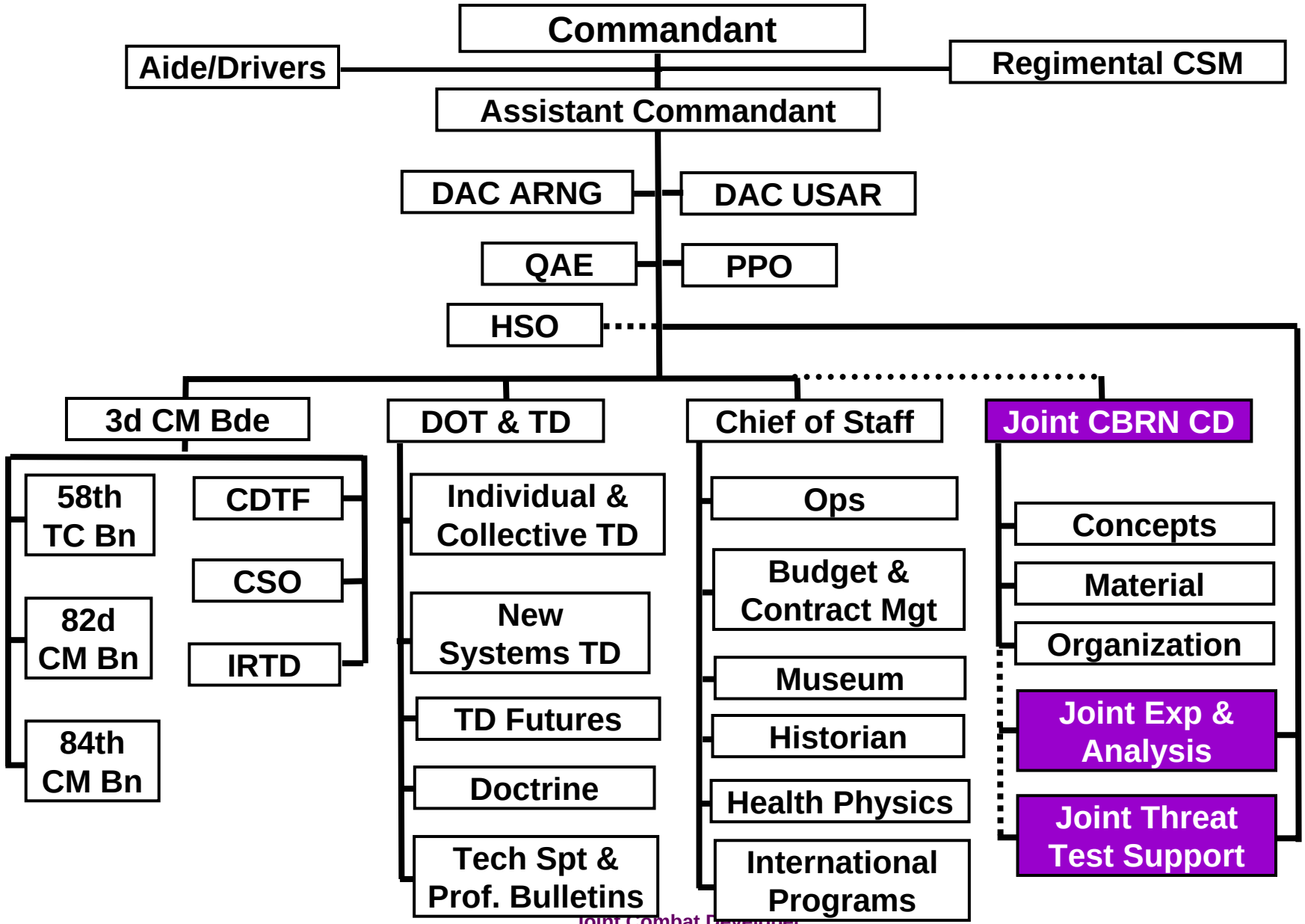
Implementation Plan for the Management of the Joint CBDP (Army as Executive Agent)

Para	Task
3.4.1	Coordinate and integrate research, development, test, and evaluation, and acquisition, requirements of the military departments for CBRN defense programs of the DoD (50 USC 1522). The Army will execute this function through sub-para 3.4.3 and 3.4.6 in the plan.
3.4.2	The Secretary of the Army as executive agent shall review all funding for the CBDP (50 USC 1522). The Army will execute this function through sub-para 3.4.3 and 3.4.5 in this plan.
3.4.3	Review and recommend approval of the CBDP POM.
3.4.4	MDA for delegated programs with authority for further delegation to the JPEO.
3.4.5	Serve as the Joint Service Material Developer to coordinate and integrate acquisition for the CBDP through the JPEO, who reports to the DAE through the AAE.
3.4.6	Provide Program, Analysis and Integration functions for the CBDP.
3.4.7	Provide the Testing and Evaluation Executive for the CBDP.
3.4.8	**Through the JRO, serve as the Joint Combat Developer for the CBDP.**

Mission Statement

The USACMLS trains Joint and International CBRN Service members; develops leaders; supports training in units; develops multi-service and Army doctrine; builds the future CBRN force; and is the Joint Combat Developer for the Joint Chemical, Biological, Radiological and Nuclear Defense Program

U.S. Army Chemical School Organization



Joint CBRN Experimentation & Analysis

Complete

1. Split MOPP – validate USAF CONOPs for Fixed Sites (Completed FY05)
2. Sensitive Equipment Decon - validate CONOPS & KPPs (Completed FY05)
3. Cold Weather Decon – Validate Cold Weather TTPs for WMD-CSTs (NGB Funded, Completed Mar 06)
4. Aerial CBRN Sensing – develop & validate CONOPS (Completed Apr 06)

Split MOPP

- **Objective:** Investigate the applicability of USAF Chemical Defense Transzone Operations (CDTO) within the Counter-Chemical Warfare (C-CW) concept for use on Joint and Multi-Service fixed sites and determine DOTMLPF impacts of CDTO on Joint and Multi-Service fixed sites.
- **First Joint CBRN Concept Experiment Performed for JRO-CBRND**
- **Location:** McGuire Air Force Base
- **Recommendations:** Multi-Service and Joint fixed sites should adopt a modified version of the USAF C-CW CONOPS which provides for use of multiple Contamination Control Areas for thorough decontamination as necessary.
- **Result:** Experiment conclusions on CDTO are currently being incorporated in the next revision of the Multi-Service TTPs for CBRN defense of theater fixed sites, ports, and airfields.



Sensitive Equipment Decon (SED)

- **Objective:** Determine adequacy of Service CONOPS and TTPs for use during thorough decon, compatibility of program KPPs and Service CONOPS, and operational suitability of SED prototypes and potential design changes
- **First Joint Capabilities Experiment Performed for JPEO-CBD**
- **Location:** Tyndal Air Force Base
- **Recommendations:** Modify program to address system transportability and US Army throughput requirements; reduce gross contamination through use of pre-wipes, investigate future means to reduce absorption of contamination during immediate and operation decon, and investigate means to employ the technology in support of clearance decon.
- **Result:** Experiment conclusions on SED provided to JPEO-CBD which used them to help focus ongoing program efforts.



Cold Weather Decon

- **Objective:** Determine if decontamination of WMD-CST reconnaissance teams can be successfully conducted more efficiently with a decon trailer during extreme cold weather (less than -20^0 F) operations than with the current doctrinal wet decon process.
- **First Joint Capabilities Experiment Performed for NGB**
- **Location:** Cold Weather Chamber, New Hampshire; …
- **Recommendations:** Doctrinal wet decon process is infeasible during extreme cold weather during high winds; with some engineering changes the trailer can be used to decon the recon personnel; trailer can be decontaminated for multiple repeated use.
- **Result:** Experiment conclusions on cold weather decon for CSTs will lead to development of Capabilities Development Document to begin new program



Aerial CBRN Sensing

- **Objective:** Determine applicability and requirements for use of aerial platforms to support CBRN reconnaissance and surveillance and develop draft Service and Joint CONOPS and TTPs for tactical aerial CBRN sensing.
- **First Joint Capabilities Experiment Performed for DTRA-STO**
- **Location:** Crystal City, VA
- **Recommendations:** All Services can benefit from CBRN surveillance and reconnaissance; plug-n-play sensors lack adequate responsiveness; sensors must be miniaturized to reside on aerial platforms.
- **Result:** Experiment conclusions being provided to DTRA-STO to help focus future S&T efforts for sensor development and support for future possible ACTD.



Joint CBRN Experimentation & Analysis

FY06 Experiments In Progress

1. **WMD-CST LOE – Validate CST TDA (NGB sponsored)**
2. **Dismounted CBRN Recon – validate equipment for JSLNBCRS Increment 2 CPD needed to support assessment of sensitive sites and interdiction (JPEO-CBD sponsored)**
3. **Air Crew Duration – validate TTPs and aircrew safety requirements for fixed wing transport aircraft (TRANSCOM nominated)**
4. **Standoff Chemical Agent Detection – Explore alternative technologies and applications (USMC nominated)**

Joint CBRN Experimentation & Analysis

FY07 Experiments

1. **Sensitive Site Assessment – develop & validate CONOPS and TTPs (JRO-CBRND sponsored)**
2. **Robotic Decontamination – develop & validate CONOPS and TTPs to modernize detailed equipment decontamination (JRO-CBRND & JPEO-CBD sponsored)**
3. **Joint Expeditionary Collective Protection – validate CONOPs & develop KPPs for development of CDD (JPEO-CBD sponsored)**
4. **CBNEWS – develop and validate CONOPS for using information from disparate non-CBRN sensors to tip and queue CBRN sensors (proposal for DTRA-STO sponsorship)**

Joint Threat Support

Currently Standing up Joint Threat Support Branch (JTSB):

- **Five intelligence specialists authorized**
- **Three of five positions filled**
- **Four by EOM August**
- **Responsible for System Threat Assessment (STAR) and Joint Test Threat Support Packages (JTTSP)**

Products:

- **Seven JTTSPs outsourced to meet immediate requirements:**

JSGPM	JSLIST-JC3
JCAD	JSLNBCRS LAV
JSLNBCRS HMMWV	JBSDS
JBAIDS	

- **UCS TTSP pending JRO Director approval**
- **Tasked to produce STAR for MS A programs: JECP, JCBRAWM**
- **JTTSPs required for FY07 to follow STAR production**

DOTMLPF Support to the CBDP

DOCTRINE

(6) Revision(1)
(2) New(2)

Multi-Service
Army-Only

MTTP for CBRN Defense Operations

FM 3-11

FM 3-11.11
Flame/RCA/Herb

Spectrum for Combating WMD (JP 3-40)

WMD-E	Sense	Shield	Sustain	Shape	CBRN-CM
	Avoidance	*Protection*	*Decon*	*Battle Management*	
FM 3-11.24(2) CBRN SSE	**FM 3-11.3(1)** CBRN CA	**FM 3-11.4** CBRN Protection	**FM 3-11.5** CBRN Decon	**FM 3-11.9** CW/BW Agents	**FM 3-11.21(1)**
FM 3-11.20(1) TE Battalion Ops	**FM 3-11.19** CBRN Recon	**FM 3-11.14** Vulnerability Assess		**FM 3-6** Field Behavior	**FM 3-11.22(1)** WMD-CSTs
	FM 3-11.86 Bio Surveillance	**FM 3-11.34(1)** Installation Defense		**FM 3-11.100(1)** CML Staffs/Units	
		FM 3-11.23(2) Installation Response			
		FM 3-11.50 Obscuration			

TRAINING

Support to the CBDP

Several courses at the USACMLS are Joint or Multi-service

Examples

- Additional Skill Identifier- L5 (Fox Operators Course) – Army & Marine
- Operational Radiation and Radiation Safe Courses – Multi-service
- Chemical Captains Career Course – Army & Marine
- Basic Noncommissioned Officer Course – Army & Navy
- Civil Support Skills Course – Army & Air National Guard
- Joint Senior Leader Course – Joint, Interagency, and International
- Technical Escort Course – Joint, Interagency, and International
- Chemical, Biological, & Radiological Defense Training Facility (CBRDTF) – Joint, Interagency, and International

Strategy – All core courses being refocused to include hazardous materials and sensitive site exploitation skills

MATERIEL

Support to the CBDP

- All CBRN Programs are “Born Joint”
- 32 developmental programs
- Joint CBRN Combat Developer drafts new capabilities documents and supports J-8 JRO-CBRND through the Joint Capabilities Integration and Development System (JCIDS) process

Examples

JWARN – Joint Warning and Reporting Network

JCAD – Joint Chemical Agent Detector

JSLNBCRS – Joint Service Light NBC Reconnaissance System

JBPDS – Joint Biological Point Detection System

JSTDS-SS – Joint Service Transportable Decon System – Small Scale

LEADER DEVELOPMENT

Support to the CBDP

Joint Training tailored to student experience level.

Example: CBRDTF – Sensitive Site Assessment/ Exploitation Training provides Basic, Intermediate and Advanced levels of training





FACILITIES

Support to the CBDP









- Classrooms
- Radiological Laboratory
- BIDS Bunker – Bio Defense
- FOX Den – Chemical Recon
- Chemical Applied Training Facility
- Chemical Biological Radiological Defense Training Facility
- CBRN Responder Training Facility (Jun 07)
- Obscuration Ranges
- Flame Ranges



LT Joseph Terry
CBRN Responder Training Facility


North Elevation


South Elevation

- Urban facade
  - factory
  - warehouse
  - postal building

  (connected by tunnels)
- Intermodal containers and railcars
- Cave complex / Confined space



Concept to Reality

- **Groundbreaking: June 05**
- **Completion: June 2007**

- Responder Training
  - WMD Civil Support Teams
  - USAR Domestic Recon and Decon
- Sensitive Site Assessment and Exploitation
  - SF Chem Recon Det
  - Tech Escort



Transforming to Meet the Combatant Commanders Needs

Meeting the Combatant Commander's Needs

- Requests from the Field
  - Enhanced Dismounted Recon to detect and identify full spectrum of battlefield hazards
  - Capabilities to assess Sensitive Sites
  - OCONUS Consequence Management capabilities

In the future, elements resembling site assessment teams or mobile collection teams moving with the ground forces to provide initial assessments of emerging ad hoc sites are likely to be important, but these elements needs to be more robust than the teams deployed in Operation Iraqi Freedom.

Quotes taken from Strategic Forum No. 211, Oct 2004, Institute for National Strategic Studies National Defense University, article titled: "Eliminating Adversary WMD: Lessons for Future Conflicts", by Rebecca K.C. Hersman and Todd M. Koca

QUESTIONS

OFFICE OF MILITARY COOPERATION - KUWAIT

KUWAIT Ministry of Defense (KMOD) Chemical Defense Program

MAJ Timothy J. Mertsock

US CBRNE Advisor

mertsockt@omcku.centcom.mil

OFFICE OF MILITARY COOPERATION - KUWAIT

CBRNE – 7/7

Last 7

• Environmental issue - visited scrap yard with 150 unknown pressurized cylinders to advise on further action



Next 7

• Assist with FMS Letter of Request signature by Director, Chemical Directorate (KMOD)

• Assist J2-Intelligence Chief with development of Crisis Management Center for KMOD.

OFFICE OF MILITARY COOPERATION - KUWAIT

CBRNE – Challenges

- KMOD Chemical Defense Directorate Program
- CBRNE FMS Case (Future)
- Coalition Training Program: US CM CO to KMOD Chemical Defense Directorate
- Environmental / Radiation Protection
- Support to EAGLE RESOLVE – Crisis Management

Department of Defense Chemical Biological Defense Program:

Integrating Joint Programs – Delivering Capabilities to the Joint Force

Mr. Jean Reed
Special Assistant for Chemical Biological Defense & Chemical Demilitarization Programs

June 27, 2006

The Chemical Soldier (1919)

World War I: The First Chemical Soldiers

"Whether or not gas will be employed in future wars is a matter of conjecture, but the effect is so deadly to the unprotected that we can never afford to neglect the question."

General of the Armies
John J. Pershing, 1919

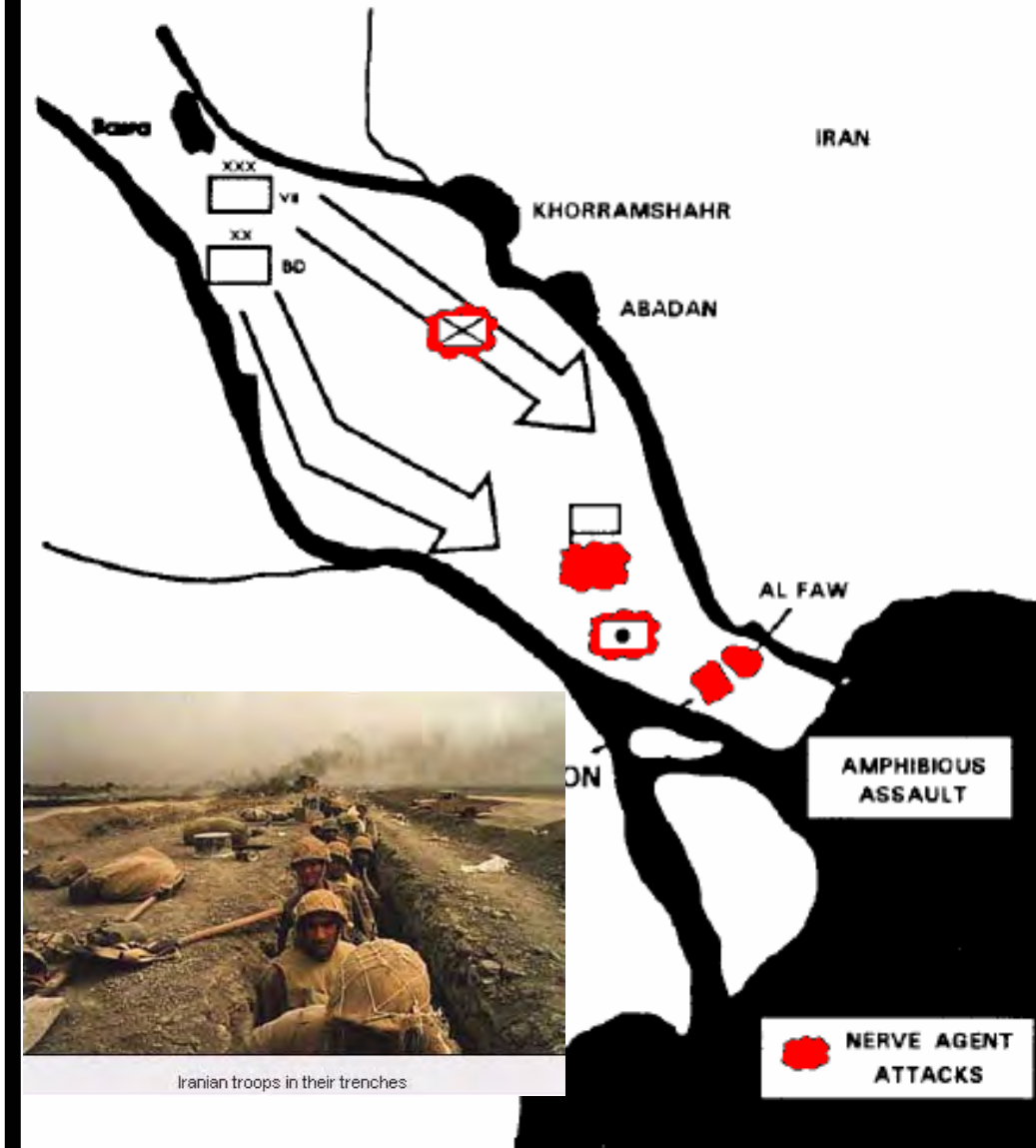


The Iraqi Use of chemical weapons drew widespread international attention to a threat that had been widely ignored.

Nerve Gas Attack in Halabja (March 1988)



Battle for Al Faw (April 1988)



Iranian troops in their trenches

The NBC Soldier (1990-91)
Operation Desert Storm

















CB Defense Deficiencies Identified in Operation Desert Storm

Detection	Individual Protection	Collective Protection	Decon-tamination	Medical
• No Organic Communication • Limited standoff detection • Limited liquid agent detection • Single biodetection technology • Limited HD detection • Limited recon • No individual detectors • High false alarm rate potential • Slow response time to HQ	<u>Masks</u> • Multiple masks for ground and vehicle functions • Limited aviator masks <u>Clothing</u> • Bulky • Superactiviated charcoal • Not launderable • Bulky accessories	• Few shelters • Very limited integrated ship & vehicle protection • Limited deployable collectively protected shelters for tactical applications	• Corrosive decontaminants • Environmentally hazardous sensitive equipment decon • Limited personal decon • Limited large area decon • Water-based decontaminants • Labor intensive	• Limited BD vaccines (Anthrax and Bot IND) • No CW prophylaxes • Limited CW pretreatment • Limited mustard agent pretreatment • Limited medical training for casualty management • Limited diagnostic capability

Chemical Biological Defense Program

- **Established by Congress**
  - **FY 1994 National Defense Authorization Act, P.L. 103-160 (50 USC 1522)**
- **Addresses critical organizational and technical shortfalls identified following Desert Storm**
  - **Single consolidated DoD wide program**
  - **Oversight centralized for efficiency and effectiveness**
  - **Initially joint efforts focused on fielding initial biological detection capabilities and procurement of personal protective equipment**

The Changing Nature of the Threat:
Non-Traditional Agents, Non-Traditional Delivery, and Non-Traditional Adversaries











CB Defense Deficiencies Addressed since Operation Desert Storm

Detection	Individual Protection	Collective Protection	Decon-tamination	Medical
• Improved Organic Communication • Improved standoff detection • Improved liquid agent detection • Multiple bio-detection technology • Improved HD detection • Improved recon • No individual detectors • Low false alarm rate potential • Improved response time to HQ	Masks • Joint masks for ground and vehicle functions • More aviator masks Clothing • Reduced Bulk • Superactiviated charcoal (Carbon Spheres) • launderable • Integrated hood • Improved quantities	• Integrated ship & vehicle protection • Improved quantities of deployable collectively protected shelters for tactical applications	• Corrosive decontaminants • Environmentally hazardous sensitive equipment decon • Improved personal decon • Limited large area decon • Water-based decontaminants • Labor intensive	• Limited BD vaccines types (Anthrax and Bot IND, Smallpox), but improved supply • Limited CW prophylaxes • Limited CW pretreatment • Limited mustard agent pretreatment • Improved medical training for casualty management • Genetic and assay-based diagnostic capabilities; In-theater capabilities

The Future CBRN Warfighter



Defense Strategy

Security Environment: 4 Challenges

VULNERABILITY

Higher

Irregular

- Unconventional methods adopted and employed by non-state and state actors to counter stronger state opponents. *(erode our power)*

  (e.g., terrorism, insurgency, civil war, and emerging concepts like “unrestricted warfare”)

Catastrophic

- Surreptitious acquisition, possession, and possible employment of WMD or methods producing WMD-like effects against vulnerable, high-profile targets by terrorists and rogue states. *(paralyze our power)*

Lower

Higher

Traditional

- States employing legacy and advanced military capabilities and recognizable military forces, in long-established, well-known forms of military competition and conflict. *(challenge our power)*

  (e.g., conventional air, sea, and land forces, and nuclear forces of established nuclear powers)

Disruptive

- International competitors developing and possessing breakthrough technological capabilities intended to supplant U.S. advantages in particular operational domains. *(capsize our power)*

  (e.g., sensors, information, bio or cyber war, ultra miniaturization, space, directed-energy, etc)

Lower

LIKELIHOOD

No hard boundaries distinguishing one category from another

Defense Strategy

Security Environment: 4 Challenges

Irregular



Higher

Catastrophic



VULNERABILITY

Lower

Higher

Traditional



Disruptive

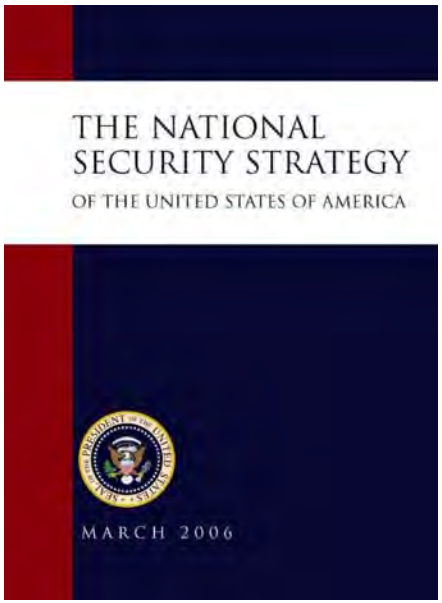


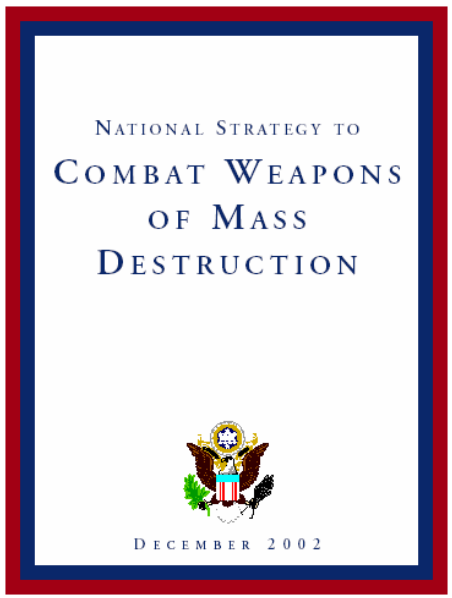
Lower

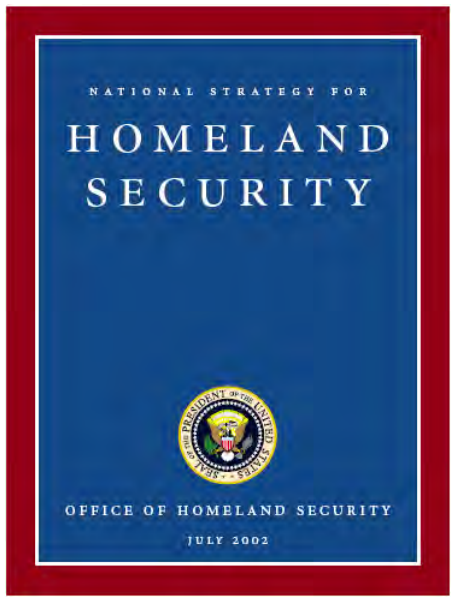
LIKELIHOOD

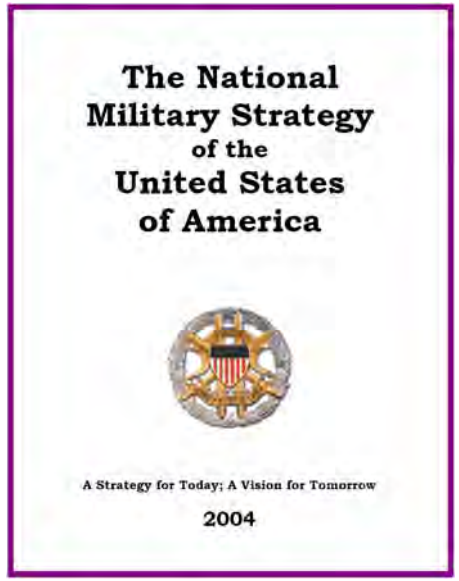
Key Strategic Guidance:

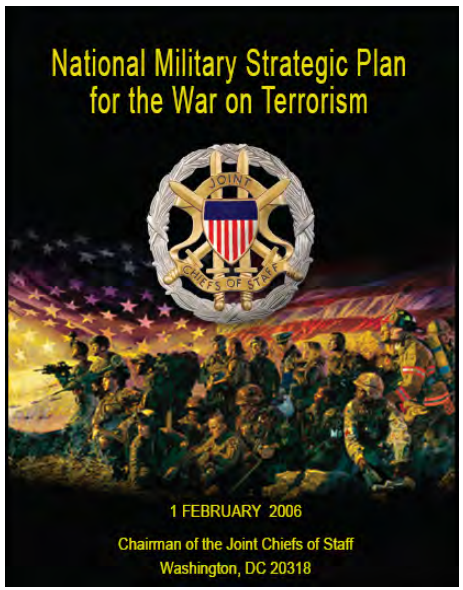
CBRN Defense is a Critical Component of National Strategies

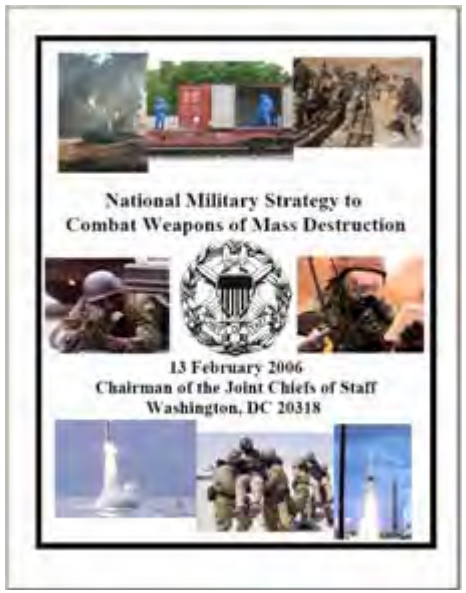


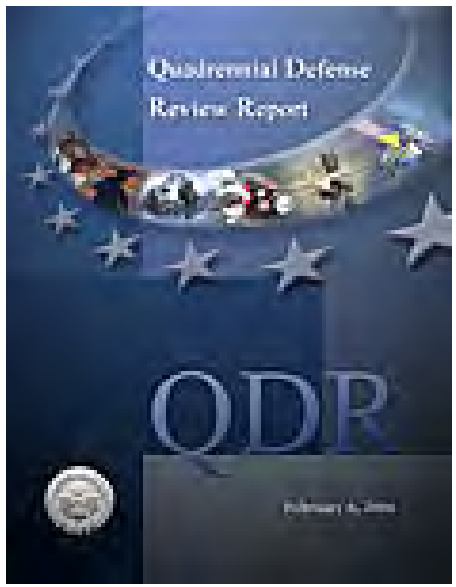


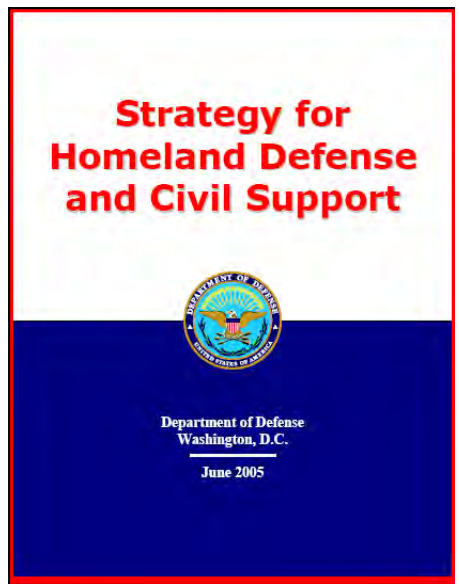








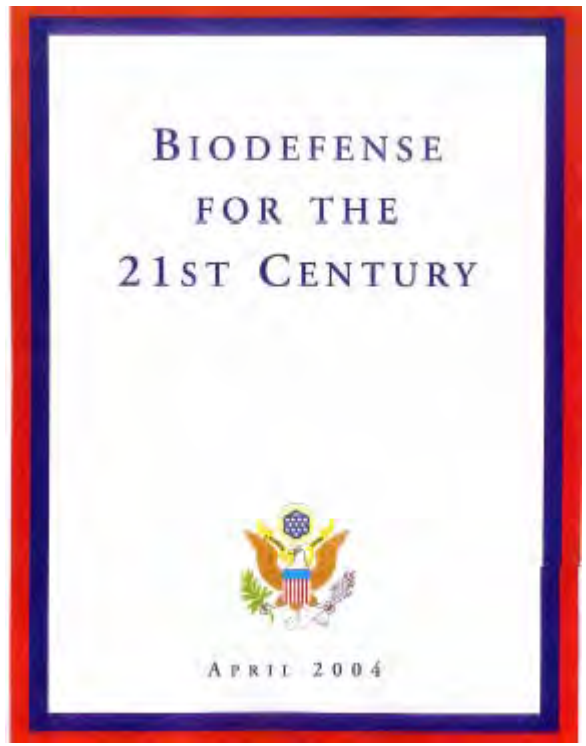




National Strategies Addressing Emerging Threats

Biodefense for the 21st Century, The White House, April 2004 (NSPD-33/HSPD-10)

- **"Preventing and controlling future biological weapons threats will be even more challenging. Advances in biotechnology and life sciences—including the spread of expertise to create modified or novel organisms—present the prospect of new toxins, live agents, and bioregulators that would require new detection methods, preventive measures, and treatments. These trends increase the risk for surprise"**
- **"The proliferation of biological materials, technologies, and expertise increases the potential for adversaries to design a pathogen to evade our existing medical and non-medical countermeasures. To address this challenge, we are taking advantage of these same technologies to ensure that we can anticipate and prepare for the emergence of this threat."**



Quadrennial Defense Review (QDR):

Vision for Combating Weapons of Mass Destruction

The future force will be organized, trained, equipped, and resourced to deal with all aspects of the threat posed by weapons of mass destruction. It will have capabilities to:

- **detect WMD, including fissile material at stand-off ranges;**
- **locate and characterize threats;**
- **interdict WMD and related shipments whether on land, at sea, or in the air;**
- **sustain operations under WMD attack; and**
- **render safe or otherwise eliminate WMD before, during or after a conflict.**

The Department will develop new defensive capabilities in anticipation of the continued evolution of WMD threats. Such threats include … genetically engineered biological pathogens, and next generation chemical agents. The Department will be prepared to respond to and help other agencies to mitigate the consequences of WMD attacks.

Quadrennial Defense Review (QDR):
Implementing the Combating WMD Vision

To achieve the characteristics of the future joint force…, the Department will:

- **Designate the Defense Threat Reduction Agency to be the primary Combat Support Agency for U.S. Strategic Command in its role as lead combatant commander for integrating and synchronizing combating WMD efforts.**
- **Expand the Army's 20th Support Command (CBRNE) capabilities to enable it to serve as a Joint Task Force capable of rapid deployment to command and control WMD elimination and site exploitation missions by 2007.**
- **Expand the number of U.S. forces with advanced technical render-safe skills and increase their speed of response.**
- **Improve and expand U.S. forces' capabilities to locate, track, and tag shipments of WMD, missiles, and related materials, including the transportation means used to move such items.**
- **Reallocate funding within the CBDP to invest more than $1.5 billion over the next five years to develop broad-spectrum medical countermeasures against advanced bio-terror threats, including genetically engineered intracellular bacterial pathogens and hemorrhagic fevers.**

CBDP Vision and Mission

VISION

Combat weapons of mass destruction through a strong chemical biological defense program.

MISSION

Provide chemical and biological defense capabilities to effectively execute the *National Strategy for Combating Weapons of Mass Destruction*. Ensure all capabilities are integrated and coordinated within the interagency community.

Program Process & Organization

OSD provides oversight

OSD Mission: Lead, Guide, and Integrate the CB Defense Program

- Combatant Commanders
- Services

Joint Requirements Office (JRO)

Required Capabilities

Capability Needs

Prioritized Needs

Test & Evaluation

Joint Combat Developer

Solutions



S&T Gaps

Joint Science & Technology Office DTRA/CB

Joint Program Executive Office (JPEO)

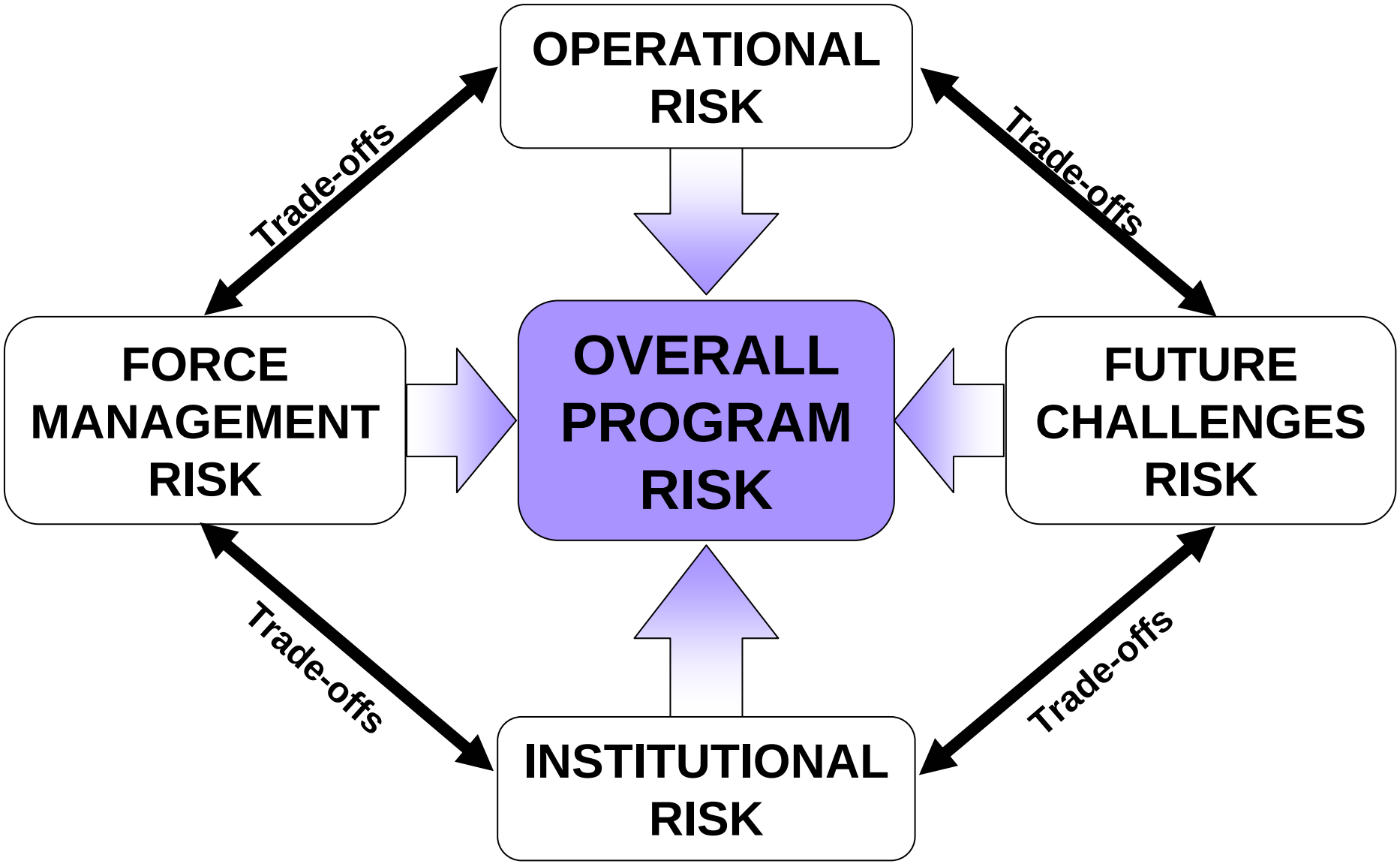
Solutions

Mature Technologies

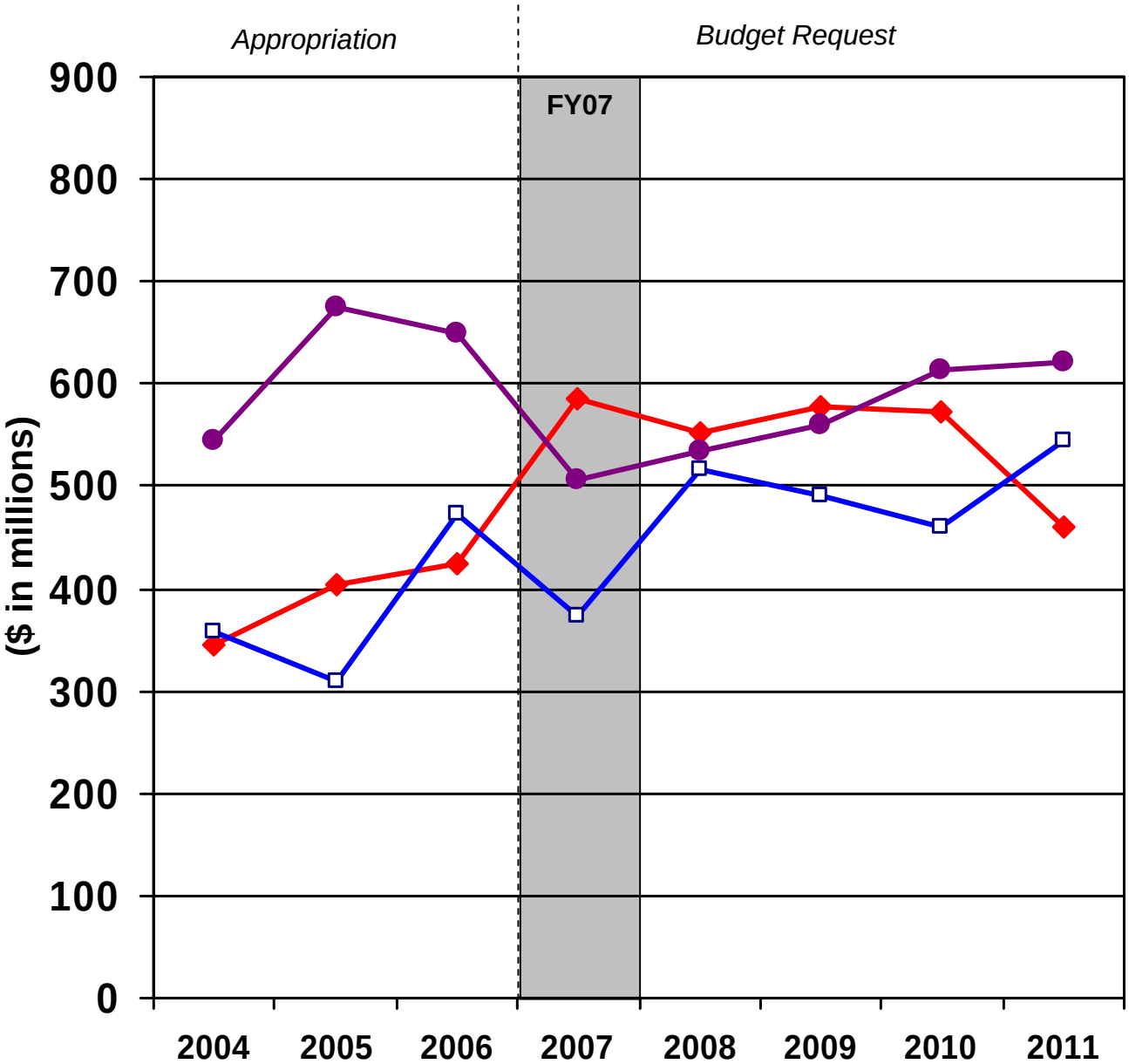
Interagency Activities

- **CBDP Formally Coordinates With:**
  - **Counterproliferation Program Review Committee (CPRC)**
  - **Technical Support Working Group (TSWG)**
  - **Department of Homeland Security (DHS), Science & Technology Directorate**
  - **National Institute of Allergies and Infectious Diseases (NIAID)**
  - **Centers for Disease Control (CDC)**
  - **U.S. Coast Guard**
- **Various Levels of Coordination/Cooperation Exist with:**
  - **National Security Council**
  - **Office of Science & Technology Policy**
  - **Department of Health and Human Services (including the Food and Drug Administration, and the Centers for Disease Control and Prevention)**
  - **U.S. Department of Agriculture**
  - **Department of Justice**

Managed Risk Strategy



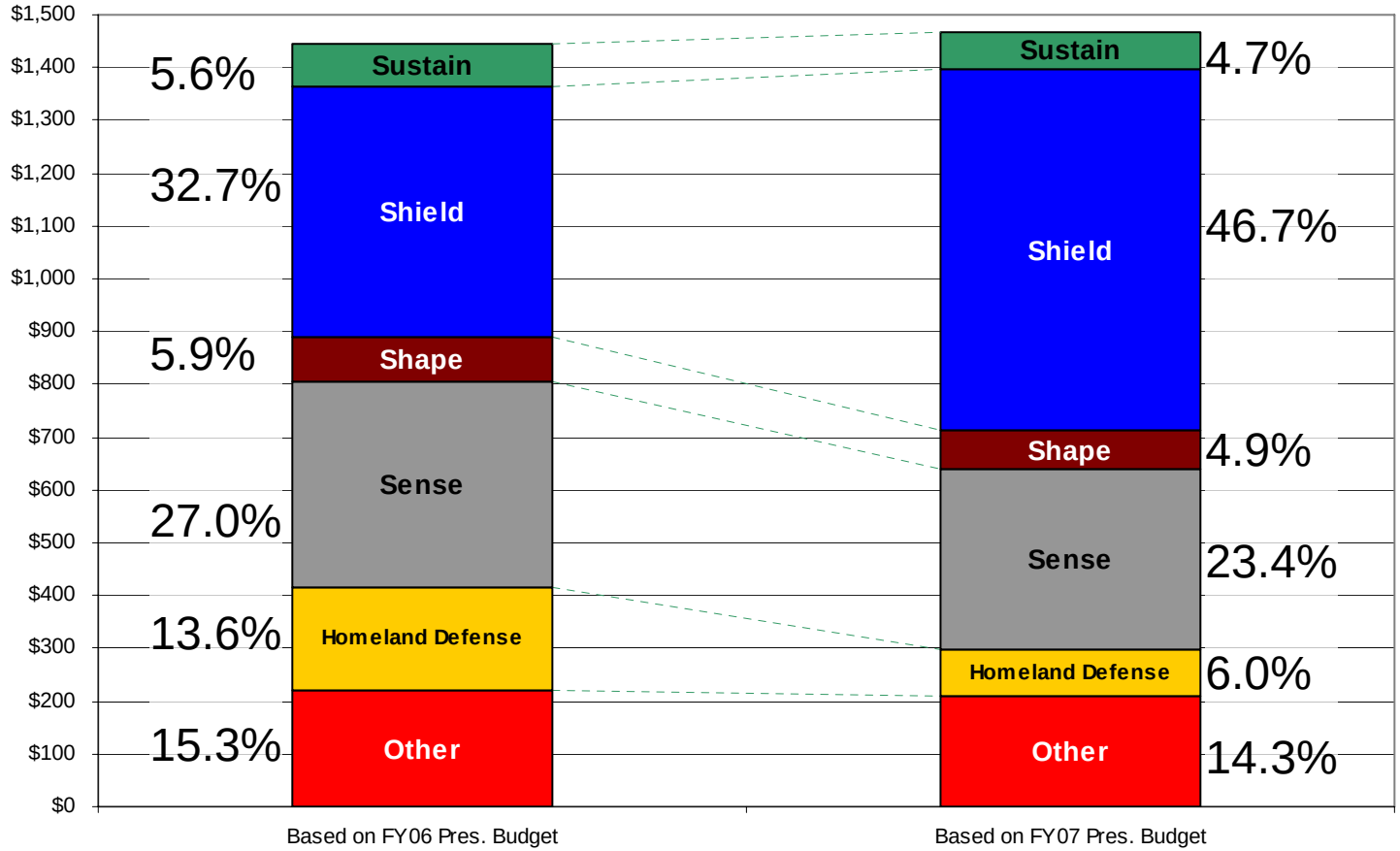
CB Defense Program Structure: FY2007 PB



FY07 Highlights

- **Near-Term Emphasis to Address Future Challenges (NTAs, Emerging Threats, Transformational Medical Technologies) and Improve the T&E Infrastructure**
- **Long term trend to Provide Advanced Capabilities to the Warfighter**

FY07 Resource Allocation:
Shifting Priorities (Impact of the QDR)



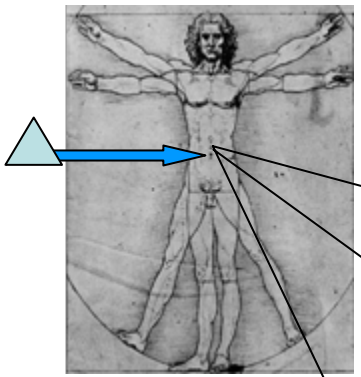
Funding shift to support the Transformational Medical Technology Initiative (TMTI)

	FY07 Budget Estimate	
($ in Millions)	Based on FY06 Pres. Budget	Based on FY07 Pres. Budget
Other	$221.2	$209.7
Homeland Defense (HD)	$195.6	$87.7
Sense	$389.5	$342.2
Shape	$85.1	$72.3
Shield	$471.6	$684.5
Sustain	$80.5	$69.0
TOTAL	**$1,443.5**	**$1,465.4**

Medical Countermeasures Against Advanced Bio Threats

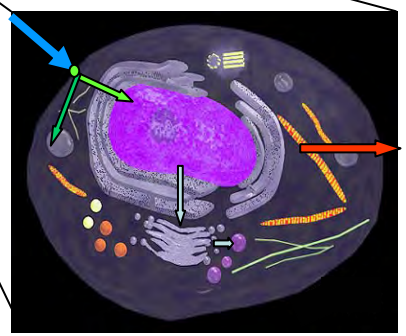
Today's Threats

- *Anthrax*
- *Smallpox*
- *Botulinum*
- *Plague*
- *Tularemia*
- *Ebola/Filo*
- *Hemorrhagic Fever*
- *Encephalitis*
- *SARS*
- *Influenza*
- *Ricin/SEB, others*



Modes of Action

- *Receptor Binding*
- *Signal Transduction*
- *Decoys*
- *Immune Avoidance*
- *Translation/Transcription*
- *Immune Deregulation*
- *Replication*
- *Virulence Expression*



Parallel Systems Approach

Solutions

Target Agent Commonalities

- Block Key Receptors
- Inhibition by Small Molecules
- Modulate Immunity
- Change Gene Expression
- Block Protein Actions
- Modulate Physiologic Impacts

Bioengineered

One *PIECE* at a time → Process Analysis → Broad Spectrum

TMTI Strategy Components

- **Systems biology – Integrates molecular and informatics**
- **Identified multiple scientific proven approaches**
  - **Genomics**
    - **Sequencing, resequencing, genomic inhibition**
  - **Proteomics**
    - **Antibodies against broadly conserved processes**
  - **Immune Products**
    - **Specific technologies under consideration**
  - **Metabolomics**
    - **Too early to apply**
- **Industry/Academic partners**
- **“DARPA-esque” execution**
- **Deliverables:**
  - **Two or more broad-spectrum therapeutics**
  - **Genomic sequences of all pertinent known threats**
  - **Platform for rapid response (characterization and manufacture of countermeasure against unknowns**

CBRN Education, Training, and Exercise Integration

MISSION

Lead and guide the integration of the DoD CBRN Defense Program Education and Training Initiatives

VISION

A comprehensively educated and trained Nation unified to effectively manage CBRNE threats.

- **Near-term goals (1-2 yrs)**
  - **Identify DoD CBRN Defense Education & Training Initiatives**
  - **Assess and Prioritize Gaps**
  - **Synchronize DoD CBRN Education and Training at all levels**
- **Long-term goals (3-5 yrs)**
  - **Expand initiatives to address broader set of threats and missions:**
    - **Combating WMD (including interdiction, elimination, and other mission elements)**
    - **CBRNE: (include "E" – High Yield Explosives)**
    - **Expand integration to include Federal Interagency's education, training, & exercise activities**

CBDP: The Way Ahead

- **Need to build on current strengths…**
  - **Integrated collection of systems**
  - **Multi-disciplinary approaches**
  - **Well developed doctrine and concepts for the military in operational environments**
- **…while recognizing a changing environment**
  - **Laboratory and other infrastructure may need overhaul**
  - **Operational environment must consider homeland**
    - **DoD now a key player, but no longer the biggest investment**
  - **Emerging and non-traditional threats may be critical**
  - **Congress will continue to play an active role**
  - **Industry may be increasingly important, though DoD-unique assets need to be identified and maintained**

CBDP: The Way Ahead

- **…and Planning for the Future**
  - **Need to balance investment between current risks (operational and procurement needs) and future risks (S&T and infrastructure)**
  - **Coordination with other agencies (DHHS, DHS, and others) for an effective national effort**
    - **DoD may play key role in transitioning technologies from laboratory concepts to field-ready systems, especially medical systems**
  - **Broad-spectrum, dual-benefit approaches will need to be evaluated in all areas**

Back up slides

Offsets to Fund Broad Spectrum Therapies for Novel Biodefense Threats

- **Reduced activities in core CBDP ($510M)**
  - **Identified efforts within the program that were sent back to the tech base for further development**
  - **Reduced procurement of consumables that were beyond initial issue**
  - **Reduced medical biological S&T activities made less necessary by broad spectrum efforts**
- **CBDP Installation Protection Program (IPP) ($760M)**
  - **$535M in CBDP procurement and $225M in Services O&M**
  - **IPP is being incorporated into an integrated national response capability with the DHS**
  - **Post-Katrina experience shows we must be fully part of the integrated response, and not just a base response**
  - **Revised IPP plan due to DEPSECDEF – June 2006**
- **The Secretary identified an additional $230M to complete funding our minimum requirement.**

Broad Spectrum Therapies for Novel Biodefense Threats

- $100M funding in FY06 – Down Payment
- $225M in FY07 – Funds Leading Edge Investment
  - **100% in Science and Technology**
  - Transformational Approaches will be applied – leverage genomics, proteomics and systems biology data explosion
  - Technical and program leadership from team of nationally recognized experts
  - **BW defense, microbiology, drug development**
  - **Will draw heavily from commercial and academic performers**
  - **Investment provided by offsets in procurement (primarily the Installation Protection Program and transfers from related science & technology investments**

Goal: Defeat of genetically engineered biological threat

CBDP Major Players



Dr. Dale Klein
ATSD(NCB)



Mr. Jean Reed
SA (CBD&CDP)



MG Howard Bromberg
JRO-CBRND



BG Steve Reeves
JPEO-CBD



Dr. Charles Gallaway
Director, JSTO



Mr. Walter Hollis
Joint T&E Executive Agent

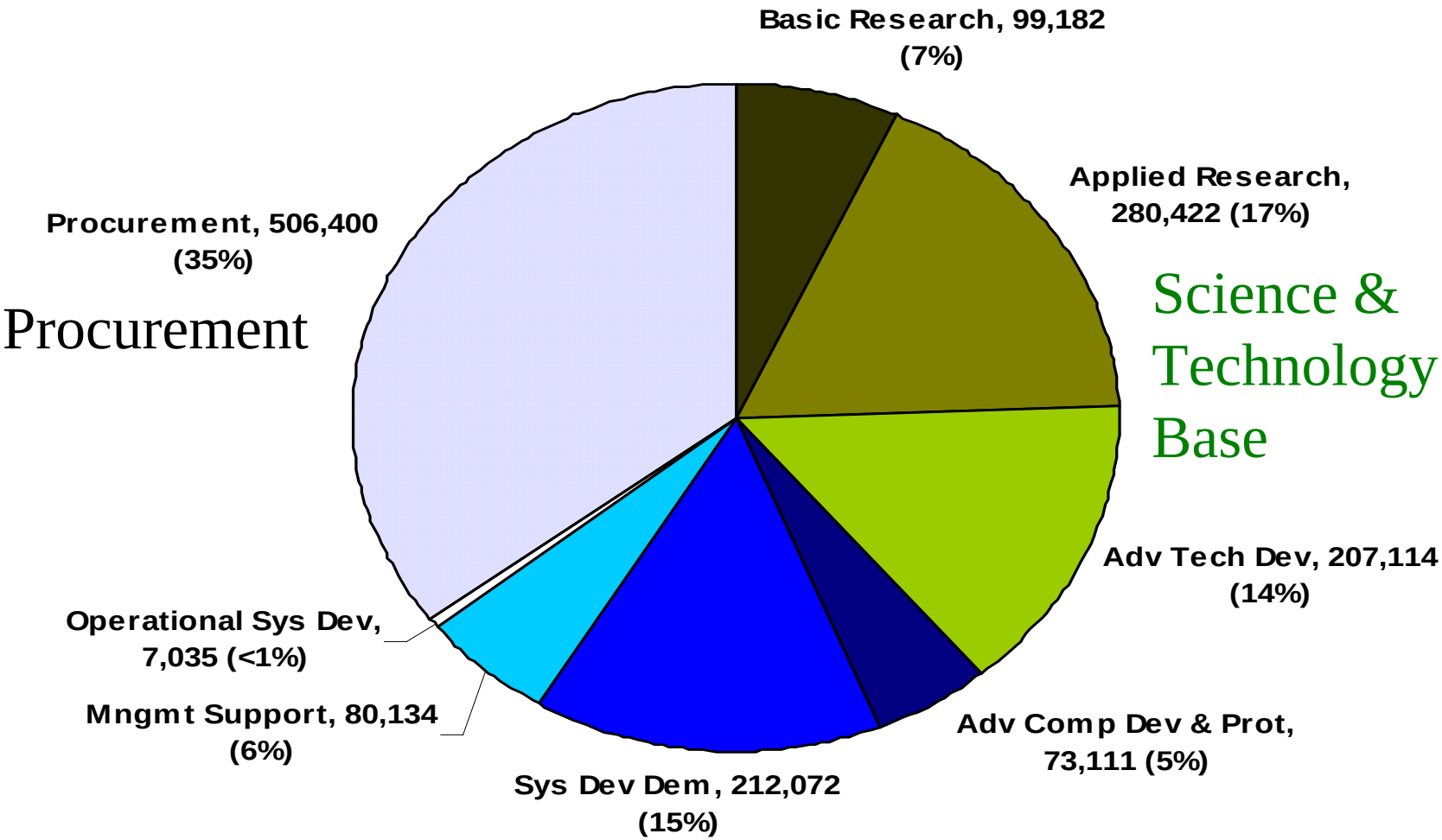


BG Stan Lillie
Joint Combat Developer

Chemical Biological Defense Program

Based on FY07 President's Budget Request (February 2006)

$1.465 Billion

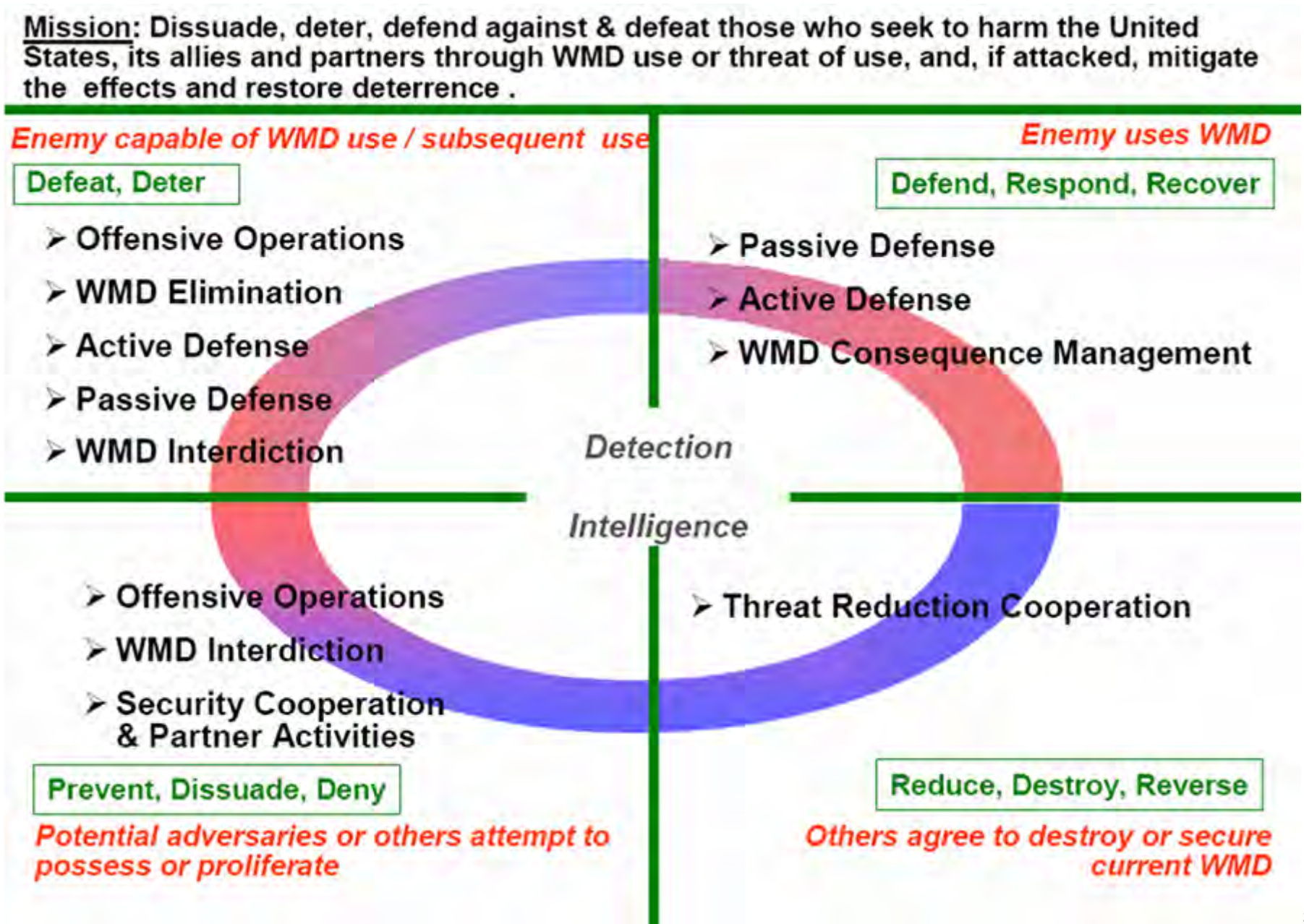


Force Planning Construct

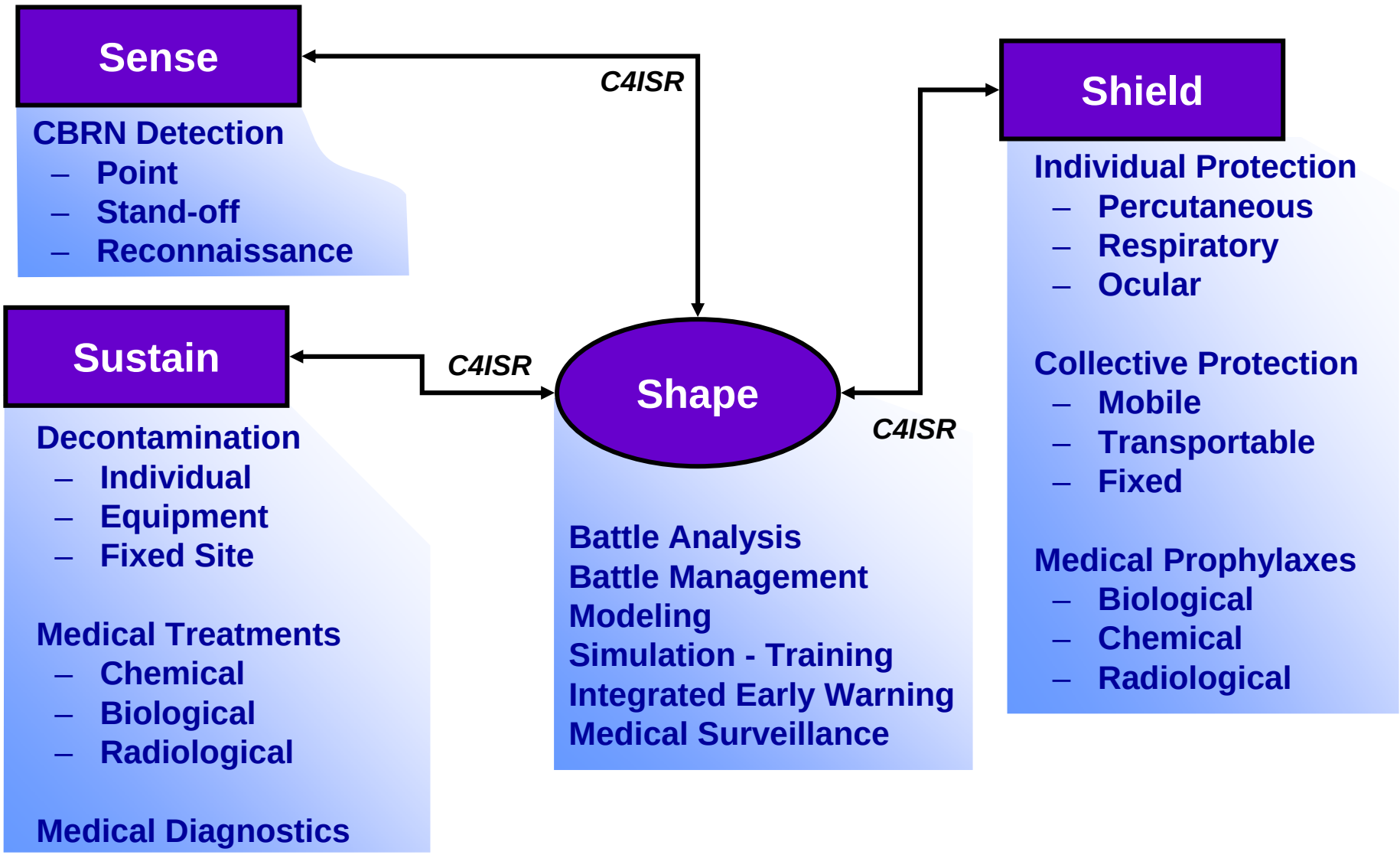
2006 Quadrennial Defense Review



Combating WMD Mission:

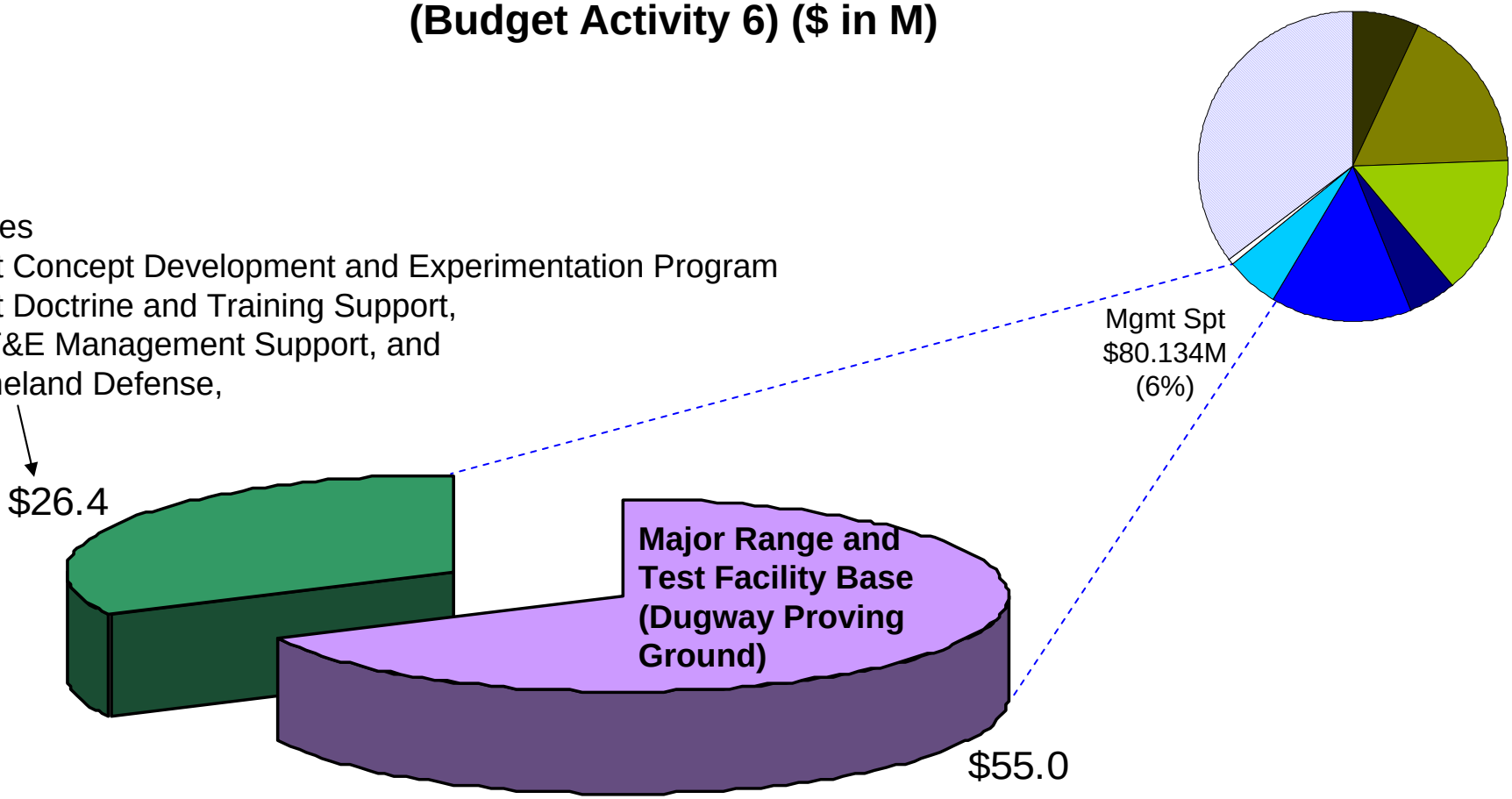


CBRN Defense
Operational Elements and Capabilities



RDT&E Management Support
(Budget Activity 6) ($ in M)

Includes
- Joint Concept Development and Experimentation Program
- Joint Doctrine and Training Support,
- RDT&E Management Support, and
- Homeland Defense,



Management account provides critical support for T&E Infrastructure in accordance with FY05 Statute to fund MRTFBs.

Broad Spectrum Therapies for Novel Biodefense Threats

- **Basic Research (BA1) $51M**
  - Directed at critical pathways in pathogen & host response
  - Identify the novel points of intervention
- **Applied Research (BA2) $109M**
  - Expand technologies – Microfluidics, nanotech, modeling
  - Develop artificial cell/artificial tissue models
- **Advanced Technology Development (BA3) $65M**
  - Expand drug discovery efforts & evaluate additional compounds
  - Develop transgenic animal models or alternate animal model systems
  - Enable rapid regulatory approval and rapid clinical development

Basis for Broad Spectrum Therapies for Novel Biodefense Threats

- **Biodefense 2020 Relman Panel**
  - **Highlighted the threat**
- **National Intelligence Estimate**
  - **Characterized the bioengineered threat**
- **Enhanced Planning Process**
  - **Identified FY06 funding for modest initiatives**
- **QDR analysis and recommendations**
  - **Established comprehensive solutions**
- **Interagency review**
  - **Scientifically feasible and executable**
- **Department QDR decision - $1.5B**

Installation Protection (Guardian) Study

- **Study will develop the following**
  - **Prioritized list of US military installations**
  - **Associated CBRNE capabilities packages for installation protection (IP)**
  - **Funding guidance to build and sustain an enhanced IP capability**
- **Focus of study**
  - **Utilizing both military and civilian assets for mission assurance against a range of CBRNE threats**
  - **How to make military assets available for civilian consequence management at local, regional and national levels**
- **Products**
  - **Area Analysis Findings**
  - **Needs Analysis Findings**
  - **Solutions Analysis Findings**
  - **Revised CBRNE IP plan to DEPSCEDEF – 30 June 2006**

QDR Built on Last Year's Enhanced Planning Process (EPP)

Areas of Additional Emphasis

Infrastructure Improvements	RDT&E Improvements
• CB T&E Facilities • NTA Test Chamber • USAMRIID (DHP)	• S&T for NTA detection • Bio detection • Medical Prophylaxis • Battle Analysis • Decontamination • Bio Defense Initiatives • Chem detection

UNCLASSIFIED

Joint Program Executive Office for Chemical and Biological Defense

PRESENTED TO:

Joint CBRN Conference
Fort Leonard Wood

STEPHEN V. REEVES
Major General, USA
Joint Program Executive Officer
for Chemical and Biological Defense
(703) 681-9600

Joint Program Executive Office for Chemical and Biological Defense

Mission

The Joint Program Executive Office for Chemical and Biological Defense is Responsible for Research, Development, Acquisition, Fielding, and Life-cycle Support of Chemical, Biological, Radiological, and Nuclear (CBRN) Defense Equipment, Medical Countermeasures, and Installation and Force Protection Supporting the National Military Strategy

Distribution Statement A: Approved for Public Release



JPEO-CBD JOINT PROJECT MANAGERS

What We Do Every Day

- **Support Current Operations**
- **Improve Current Systems**
- **Build the Future**

What Have We Done for You Lately

Fielding 30 Chem Bio Defense Systems in FY06-07

Major New Fieldings: FY06-07

- Joint Service Chemical Environment Survivability Mask
- Joint Service General Purpose Mask
- Joint Service Decon System - Small Scale
- Joint Service Personnel Decontamination System RSDL
- Joint Biological Agent Identification & Diagnostics System
- Joint Service Mask Leakage Tester
- Joint Effects Model Block I
- Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System

Sixteen (16) Planned New/upgraded Capabilities



Joint Effects Model (JEM)



Joint Biological Agent Identification & Diagnostics System (JBAIDS)



Joint Service Chemical Environment Survivability Mask (JCSEM)



Joint Service General Purpose Mask (JSGPM)



Joint Service Transportable Decon System-Small Scale (JSTDS-SS)



Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System (JSLNBCRS)

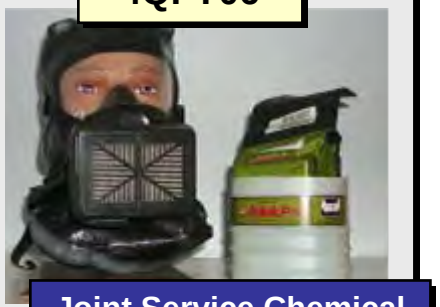
Joint Service Chemical Environment Survivability Mask (JCESM)

- **Potential Non-combatant Replacement for M-17**
- **Milestone C January 2006**
  - **Low Rate Initial Production (LRIP) Approved 19K Masks**
  - **Unit Cost Under $100.00**
  - **Funded to Procure 193K Masks**



Individual Protection Fielding for FY06 & 07

4QFY06



Joint Service Chemical Environment Survivability Mask (JCESM)

2QFY06



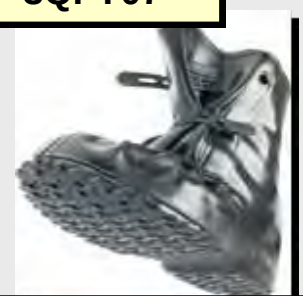
Joint Service Mask Leakage Tester (JSMLT)

2QFY07



JSLIST Block 2 Glove Upgrade (JB2GU)

3QFY07



Alternative Footwear System (AFS)

2QFY07



Joint Service General Purpose Mask (JSGPM)

1QFY07



Integrated Footwear System (IFS)

3QFY07



Joint Service Aircrew Mask (JSAM)

Chemical Biological Medical System Fielding for FY06 & 07

336 JBAIDS





- Air Force
- USMC
- ARMY
- Navy

- Floats
- Training
- Depot Spares

Joint Biological Agent Identification and Diagnostics System (JBAIDS)

Collective Protection Fieldings for FY06 & 07



Collectively Protected Expeditionary Medical Support System (CP EMEDS)



Chemical and Biological Protective Shelter (CBPS)

All Services



Collectively Protected Deployable Medical System (CP DEPMEDS)



Collectively Protected Small Shelter System (CP-SSS)

Not Shown: Shipboard Collective Protected System (CPS)

Other Fieldings for FY06/07

FY 07



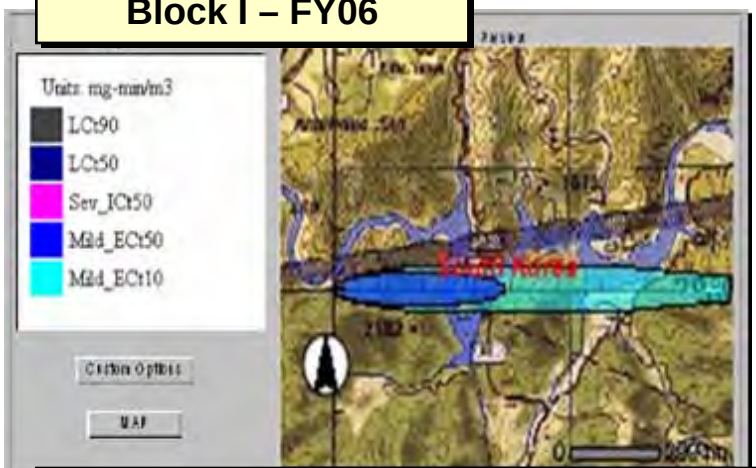
Joint Service Transportable Decon System – Small Scale (JSTDS-SS)

November 2006



Joint Service Personnel Decontamination System RSDL (JSPDS)

Block I – FY06



Joint Effects Model (JEM)

Block II – FY07



Joint Warning and Reporting Network (JWARN)

Delivering SOCOM Capabilities



Supporting GWOT

Life Cycle Management: RESET

RESET: Equipment Deployed in OEF/ OIF Identified as Requiring Depot/ Contractor Repair

- Leveraging Service O&M
- Coordinating Required Contractor Support
- Synchronizing Repairs With MWO's and Technology Insertion

Example Systems:

- M17/ M12 Decon Apparatus
- M21 Remote Standoff Chemical Agent Alarm
- M22 Automatic Chemical Agent Detector and Alarm
- FOX NBC Reconnaissance Vehicle
- Chemical Biological Protective Shelter

Fox NBC Reconnaissance Vehicle Survivability Upgrade

- **Meets Operation Iraqi Freedom Urgent Need**
  - **Improved RPG Protection: Slat armor**
  - **Improved IED Fragmentation Protection**
  - **Up-gun to M2 Machine Gun**
    - **Common Remotely Operated Weapon System (CROWS)**
  - **VIC III Communications Installed at the Same Time**



Up-Armor Protection for the Warfighter

Department of the Army Guidance:

"…armor all tactical wheeled vehicles (TWVs) deployed in support of OIF/OEF…"

Three CBRN Systems Redesigned:

Chem-Bio Protective Shelter (CBPS) Biological Integrated Detection System (BIDS) M56, Coyote, Smoke Generator

Up-Armor Solutions

Current → **Future**



Chem-Bio Protective Shelter (CBPS)



Medium Tactical Vehicle



Biological Integrated Detection System (BIDS)



LTVM with Trailer



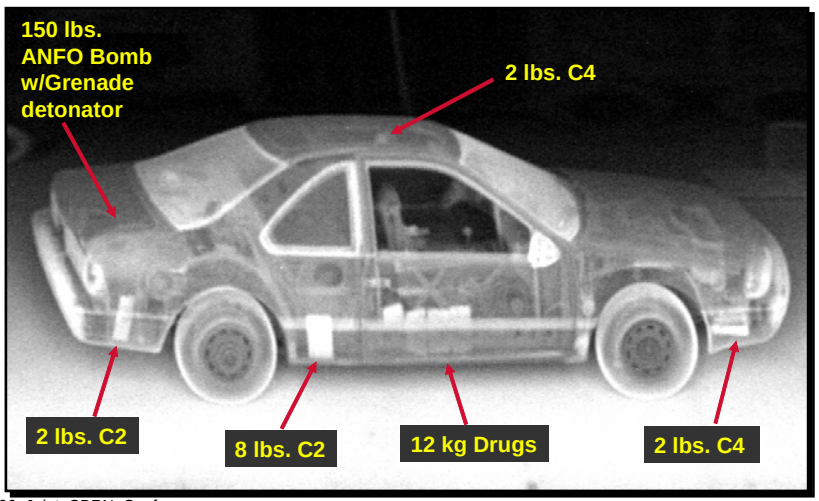
M56 Coyote, Smoke Generator



Up-Armored HMVVW

Z-Backscatter Van

- **Mobil X-Ray System in Commercial Van**
  - **Scan for Explosives, Weapons, Drugs / Contraband**
  - **Two-person Crew; Remote Operation at 0.5 Km Standoff**





Joint Acquisition CBRN Knowledge System (JACKS)

- CBD Equipment
  - Characteristics
  - Advisory Messages
  - Shelf Life
  - Safety Messages
  - Training
  - Quality Control
  - Access to JTAVRW



Available to All DoD Personnel with a Common Access Card

Sign In at:

https://jacks.jpeocbd.osd.mil

JPEO-CBD Web Site

- Organization & Contact Info
- Product Fact Sheets & Brochures
- CBD Quarterly Magazine
- New Equipment Training
- Safety Messages
- Regionalization Position Info
- Reports *(Hotline, Surge, etc.)*
- Non Standard Equipment Process
- News & Events
- Hot Topics
- Links
- Photo Gallery
- Contact Us

http://www.jpeocbd.osd.mil

-or-

https://secureweb.hqda.pentagon.mil/jpeocbd_secure

Software Support Activity (SSA)

A Single Activity to:

- **Support Integration Interoperability Using a Common CBRN Architecture**
- **Define CBRN Standards and Protocols**
- **Verification, Validation and Accreditation**
- **Ensures CBRN Software Compliance with DoD Standards**

Help Desk Call Center
877 328-0371 or DSN 524-4684

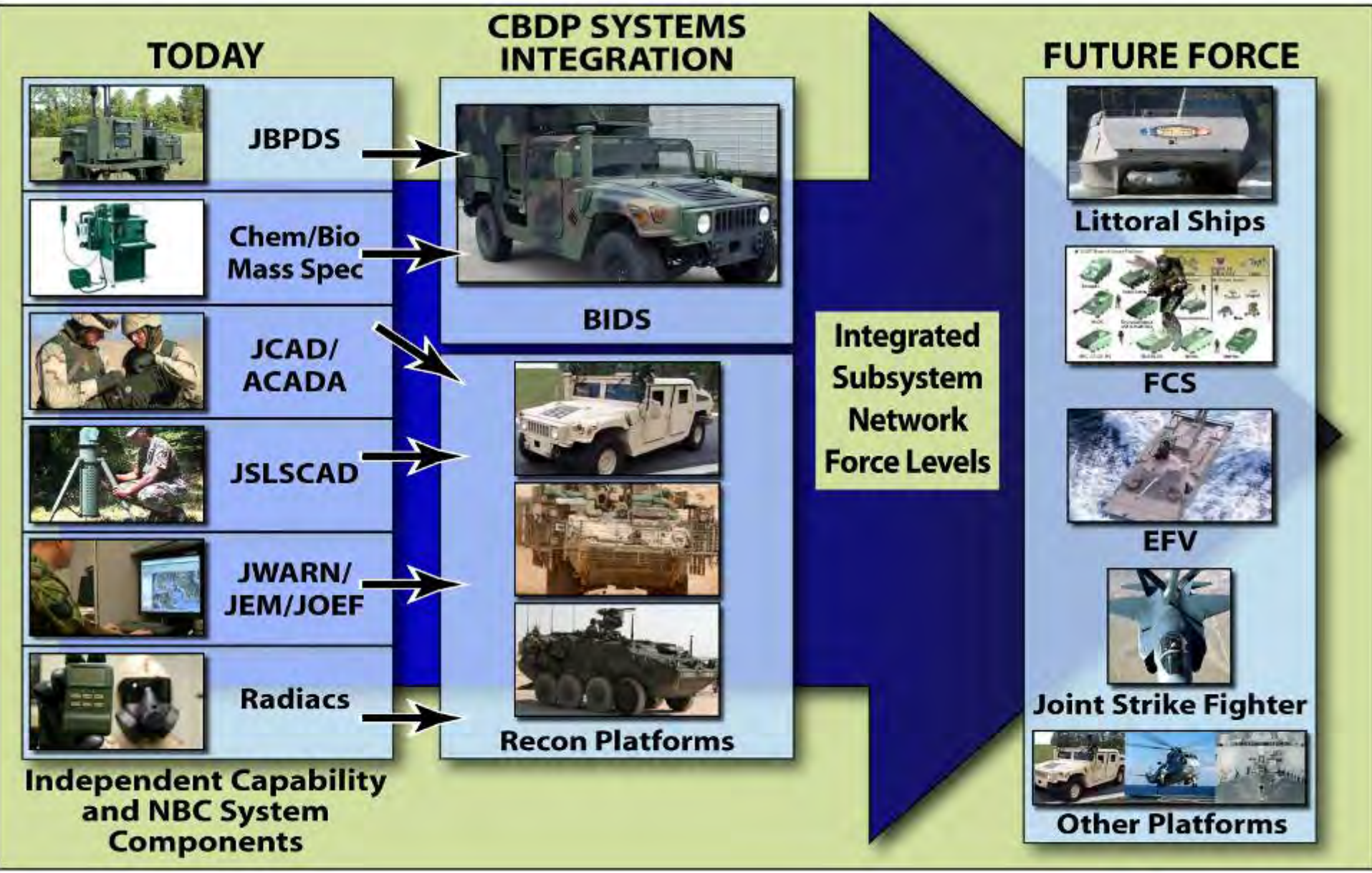
Help Desk Web Access
https://sskc.spawar.navy.mil/

Synchronizing Near Term Needs

Synchronization

- Synchronize and Integrate the Interdependent Program Segments in a Dynamic Systems of Systems, Networked Environment
- Networked Systems, Technology and Standards Evolve - There will Never be a Stable Environment/ Requirements, Even in Full-Rate Production
- Total Life Cycle Management, Including Logistics, Training, Industrial Base, Readiness Improvements are an Integrated Part of Our Planning, Resourcing and Execution

Synchronizing With Major Programs



The Future of CB Defense



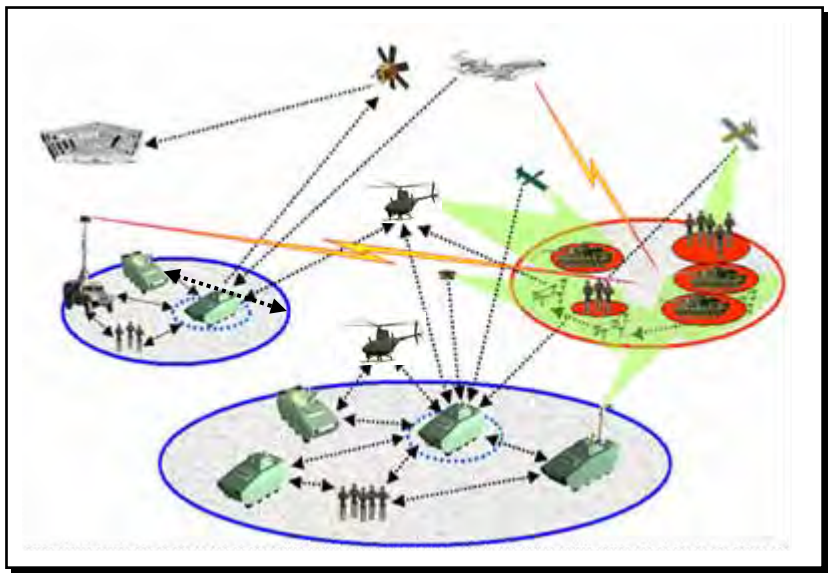
Net-Centric

Modular / Tailorable

Future of CB Defense

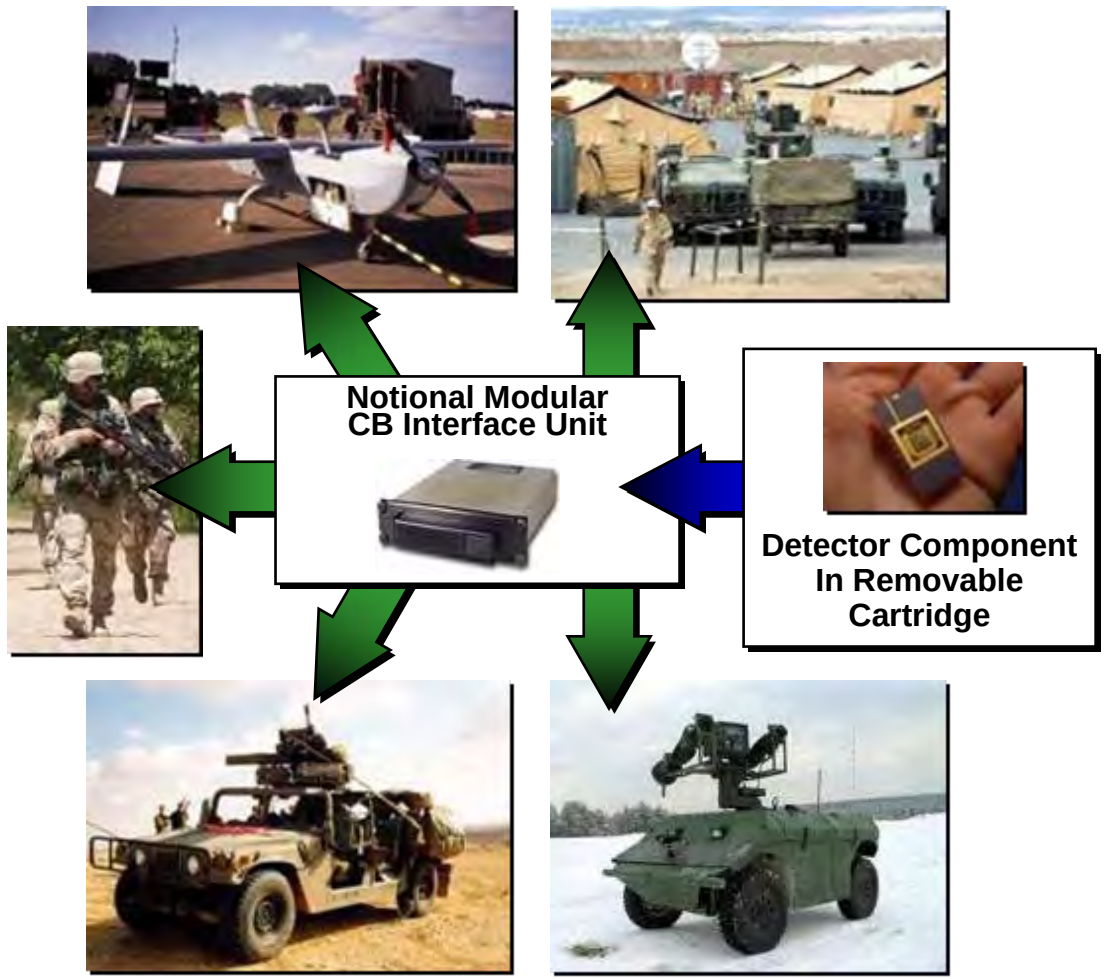
- **Net-Centric CB Defense Architecture**
  - **A family of Integrated Systems (Sensors, Information Systems, Protection Systems, Consequence Management Tools)**
  - **Continual or On-demand Access to Data Through Various Ports and Peripherals on the network**
  - **Shared Awareness, Increased Speed of Command, and Self Synchronization**
  - **Interoperable and Seamless Capability that Provides Exponentially Increased Military Benefit to Those Systems/Soldiers that Otherwise Operate Independently**





Future of CB Defense

- **Modular and Tailorable Sensor Systems**
  - **Two Key Parts:**
  - **Multipurpose, Inter-changeable Detectors**
  - **Common Interfaces**
    - **Mechanical**
    - **Power**
    - **Communication Signal and Protocols**



Plug-n-Play Capability

Future of CB Defense

Today





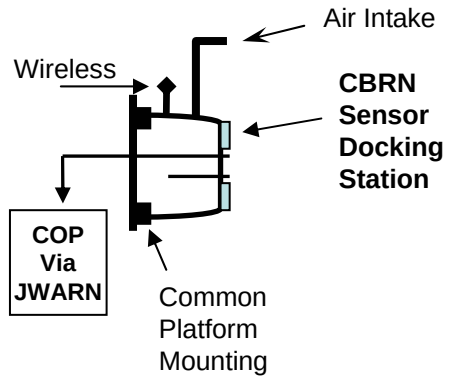


0-3 Years





JCID on a Chip



7-15 Years

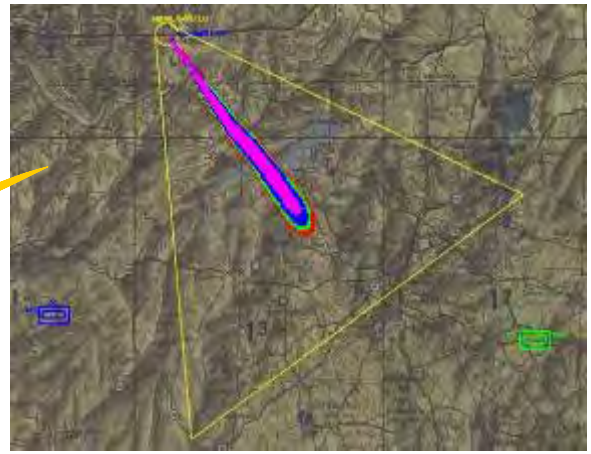




Today's Functional Demo



Joint Warning and Reporting Network



LAN

HOLSTER LAN connection

Identifinder







Wireless card





Serial Cables



JWARN on C2PC



ADM300 Sensor Simulator

Sensor interface and other CB apps

Wired & Wireless Communication to JWARN

Future of CB Defense



Limited Objective Experiment (LOE) Net-centric/Modular Demonstration

Oct-Nov 2006, Aberdeen Proving Ground, MD

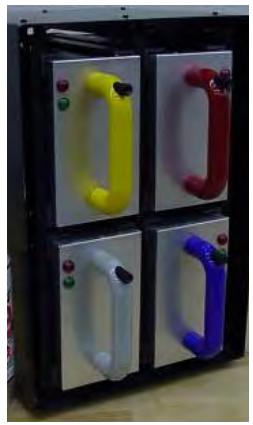
JCID on a chip, PDA, and/or other comm. components



Network Capable
Wireless Capable
GPS Capable



Sensors repackaged for optimal form, fit, and function



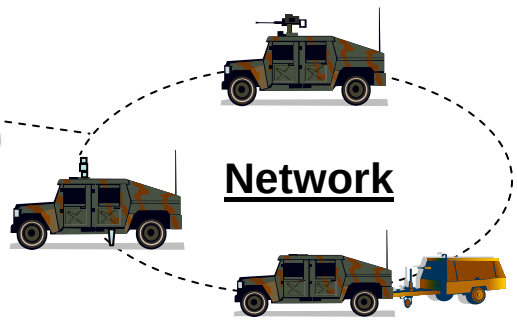
"Holster" Rack for universal plug & play and battery recharge



Laptop for user interface, data access, and sensor management



Comms to remote station, link to other vehicles via network



Future of CB Defense

Net-Centricity… Modularity … Tailorability

We Need Your Input!

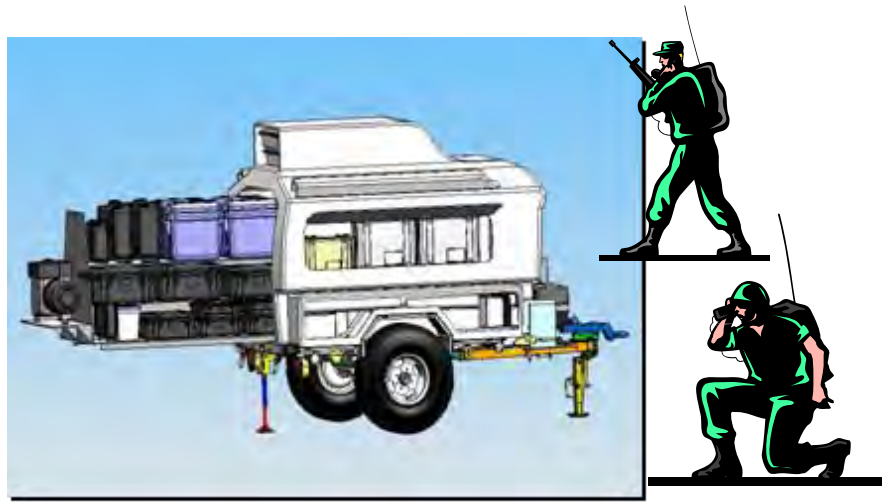
What's Good / What's Bad?

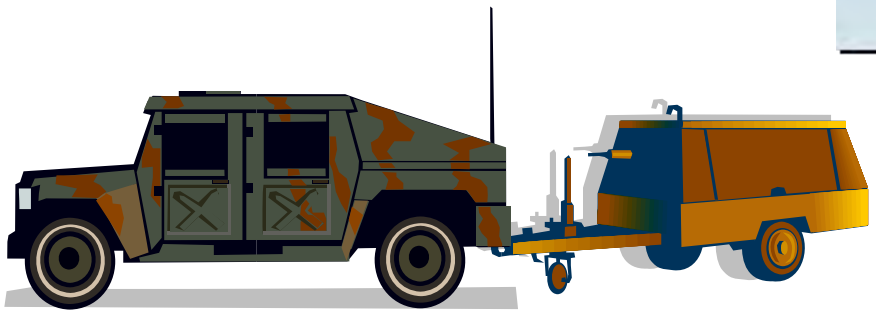
What Common Interfaces Make Sense?

How Do we Drive Technology to Meet Future Concepts?

Joint CBRN Dismountable Reconnaissance System Limited Objective Experiment

Identify Light CBRN Detection and Identification Equipment Sets for Mounted and Dismounted Reconnaissance





Demonstrate Net-Centric/Modular Sensor Concept Capabilities



Joint Expeditionary Collective Protection (JECP) Limited Objective Experiment



Examine Collective Protection Concepts of Operation for Expeditionary Forces

Joint CBRN Aerial Sensing Payload (JCASP) Limited Objective Experiment

Assess the Utility of Using CBRN Sensors on Unmanned Aerial Vehicles to Conduct Recon Operations



Sensitive Equipment Decontamination (SED) Limited Objective Experiment

Assessed Prototype Systems and Procedures for Decontaminating Sensitive Equipment

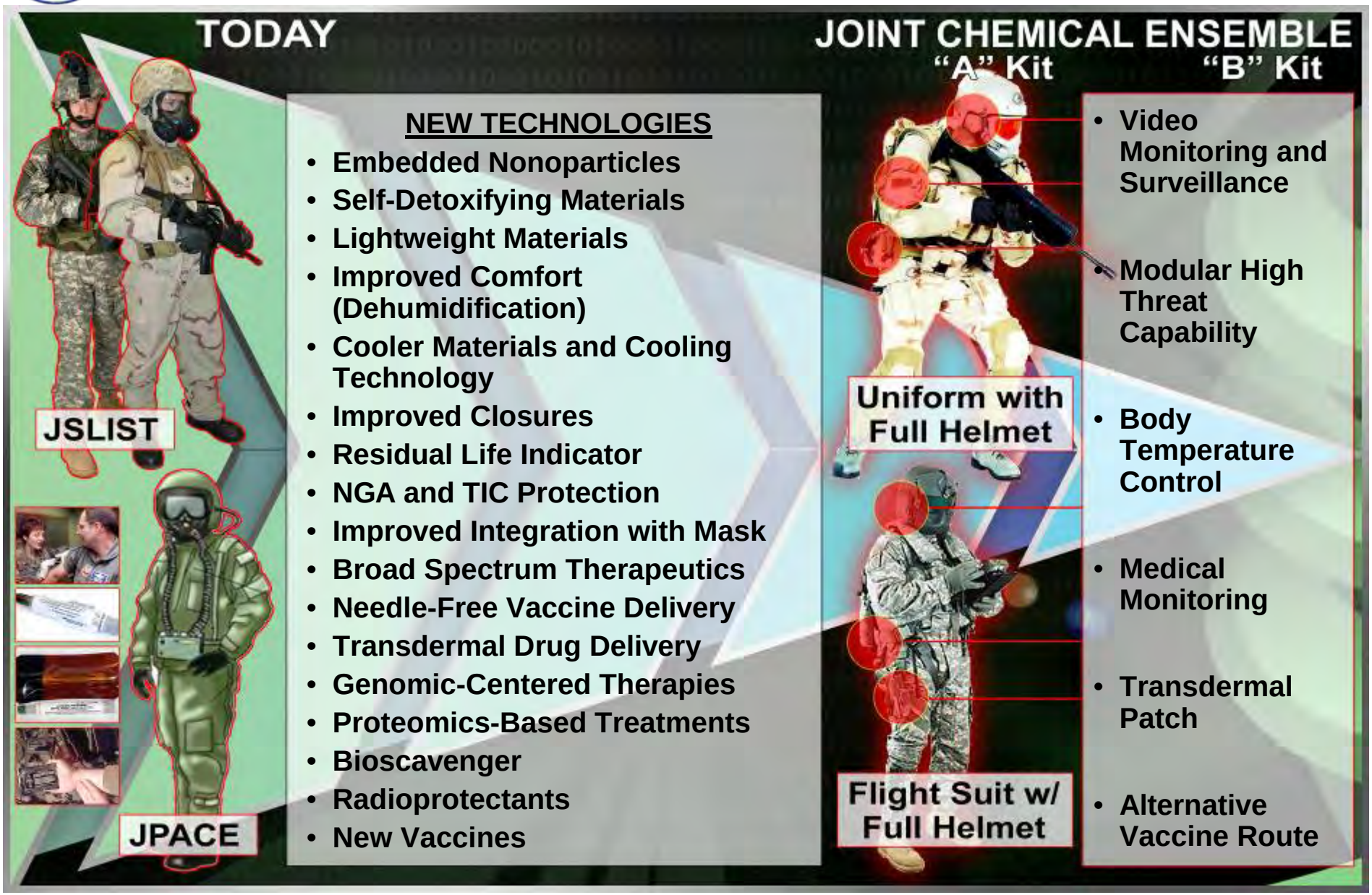




Other Limited Objective Experiments

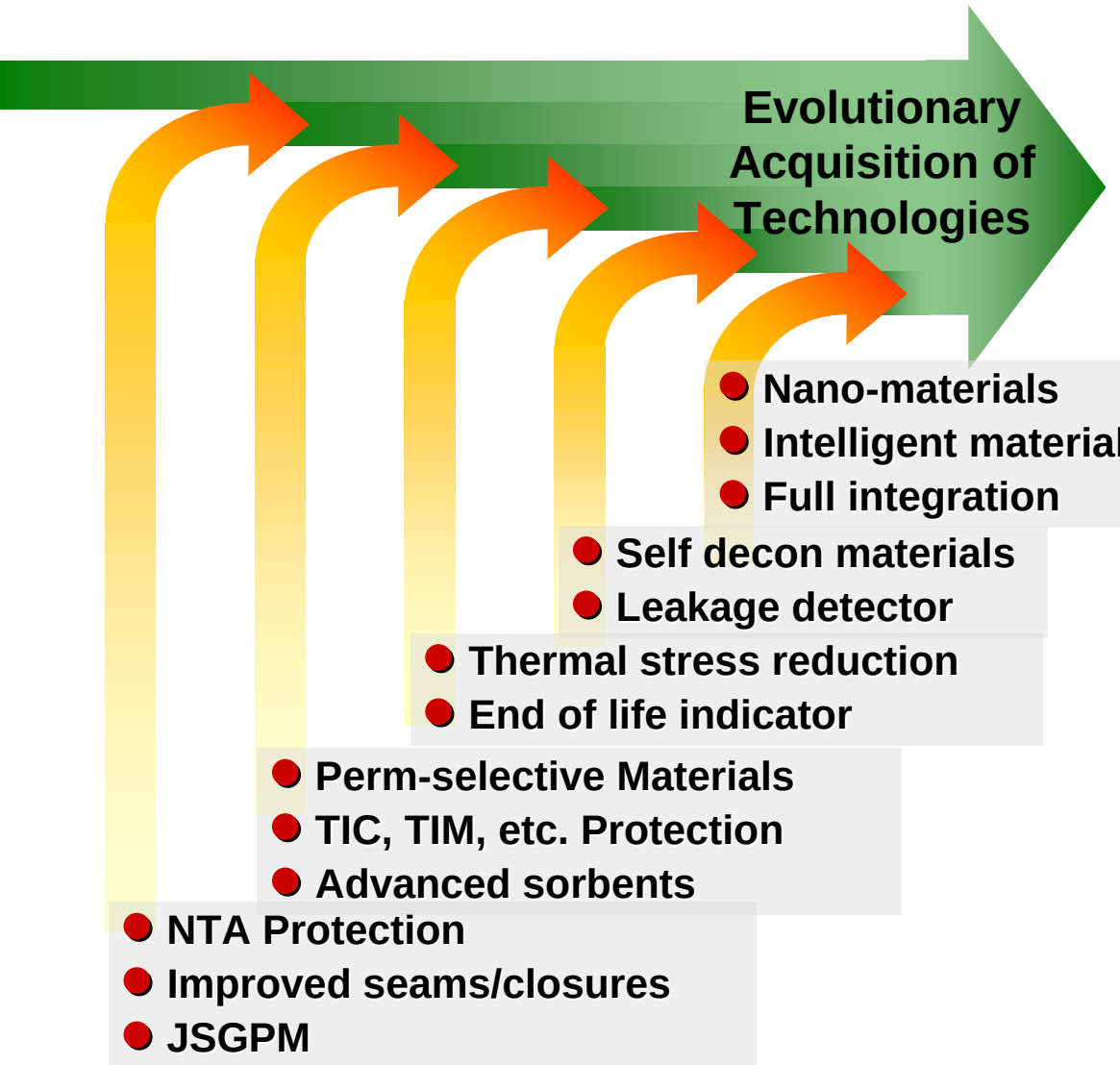
- Cold Weather Decontamination Trailer (FY06)
- WMD Civil Support Team (CST) Duration (FY06)
- Aircrew Duration in Protective Ensemble (FY06-07)
- Robotic Decontamination (FY07)
- Sensitive Site Exploitation (FY07)

Warrior as a System



Joint Chemical Ensemble

Next Generation Protective Ensemble





Joint Chemical Ensemble

- Cool & Lightweight
- CB Protective
- Standard duty uniform
- Increased mission duration
- Reduced logistics burden
- Fully integrated w/ mask, boots, gloves, helmet, body armor & weapons
- Reduced doffing hazard

Future Challenges

- **Constrained Financial Resources**
  - **Balancing Near-Term Operational Needs and Preparing for Future Threats**
- **Expanded NBC Capability for Army Brigade Combat Teams**
- **NBC Capabilities for Major Combat Systems**
- **<u>Properly</u> Equipping the Force for Expanding Mission Sets**

Better – Faster – Cheaper

Joint Program Executive Office



Chemical and Biological Defense

USAMRMC Capabilities to Support the Chemical and Biological Defense Program

presented to

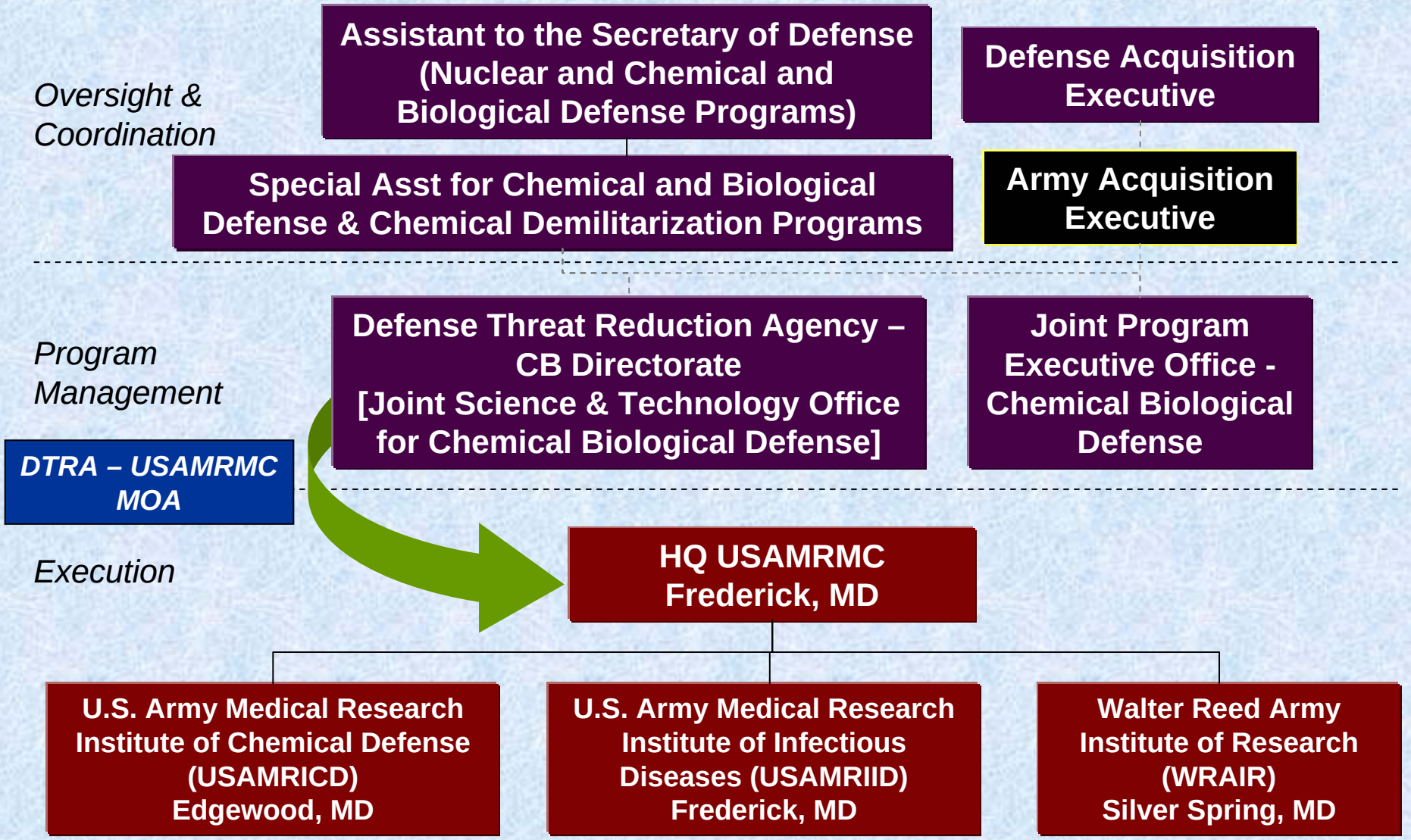
Joint CBRN Conference and Exhibition

by

James A. Romano, Jr.
Deputy Commander
US Army Medical Research and Materiel Command

Organization

USAMRMC and the Chemical Biological Defense Program



USAMRMC Laboratories

Key Role in Product Development

Research



Product Testing



Development



- NIAID
- Universities
- Industry
- DHS
- DOE
- DOD

Increased Investments Since FY02

Efficacy Testing

Pharma Industry



Vaccines

Bioshield Increases $$ Incentives to Manufacturers

Drugs



USAMRMC Unique Strengths

- Large scale medical product testing capability
- High containment labs and animal facilities
- Aerosol challenge for large studies
- FDA regulated safety and efficacy

U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID)







Unique Expertise

- 34 years of experience safely handling the world's deadliest pathogens in biocontainment
- Most of the Nation's experts in infectious aerosols work at USAMRIID
- Most of the Nation's subject matter experts on biological threats

Facilities

- Aerobiology labs
- Biosafety Level (BSL)-4 labs
- The "Slammer" – The only BSL-4 patient care suite in the Nation

Capabilities

- Large-scale testing and evaluation of medical product evaluation in animal models
- Aerobiology
- Animal Models and Pathogenesis
- Outbreak investigation/support
- Definitive I.D. of new threats/bioforensic analysis

Part of a national system of medical countermeasure development

USAMRIID Activities

Recent/Pending Transitions

- Recombinant staphylococcal enterotoxin A and B (SEA/SEB) vaccine candidates
- Vaccine candidate V3526 (multivalent VEE vaccine candidate)
- Recombinant protective antigen (rPA) anthrax vaccine candidate
- Immunologically and nucleic-acid-based medical diagnostics (reagents, protocols and devices) for JBAIDS

Current Efforts

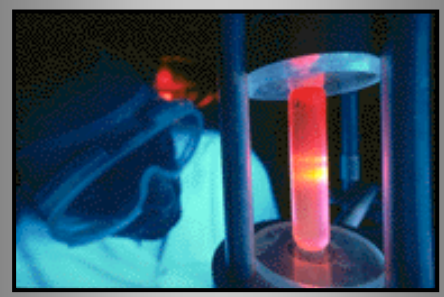
- Recombinant ricin vaccine candidate
- Alternative vaccine delivery methods for application with rPA, SEB, and F1-V plague vaccine candidates
- Oral form of cidofovir for smallpox pre-/post-exposure treatment

Partnering

- 126 active CRADAs
- 377 active Material Transfer Agreements







U.S. Army Medical Research Institute of Chemical Defense (USAMRICD)

Unique Expertise

- Neurotoxicology
- Skin protection and decontamination
- Medical management of chemical casualties

Facilities

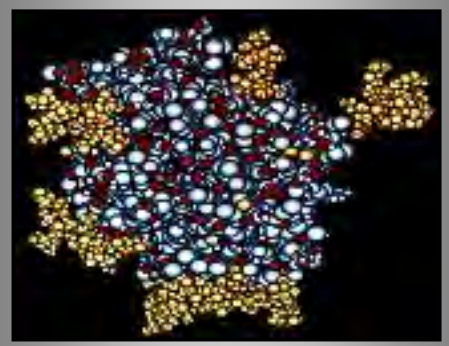
- Chemical surety facility
- Neurophore electrocorticographic recording system
- Nerve/muscle physiology testing facilities
- Molecular modeling and genomic analysis systems

Capabilities

- Drug discovery and preclinical development
  - Nerve agent pretreatments and therapies
  - Vesicating agent therapies
  - Non-traditional chemical threats
  - Biological neurotoxins
- Biomedical sample analysis for CW agent exposure







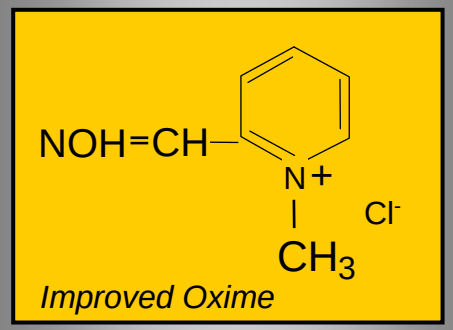
USAMRICD Activities

Recent Transitions

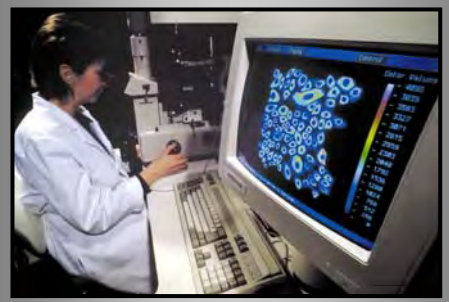
- Plasma-derived nerve agent bioscavenger
- Oxime Replacement for 2-PAM

Current Efforts

- Recombinant nerve agent bioscavenger
- Vesicant countermeasure candidates
  - Chemical scavengers
  - Anti-inflammatories



Improved Oxime





U.S. Army Center for Environmental Health Research (USACEHR)



Facilities

- Building 568
- Renovations Completed 2005 (>$13.5 M in Renovation)
- Well Water Supply
- 33,402 ft²





Capabilities

- Molecular Toxicology
- Mass Spectrometers
- Extensive Analytical Chemistry/Protein Chem
- Complete Aquaculture Facilities
- AAALAC International Accredited



USACEHR Activities

Recent Products

- Intelligent Automated Biomonitor System
- Coliform Analyzer

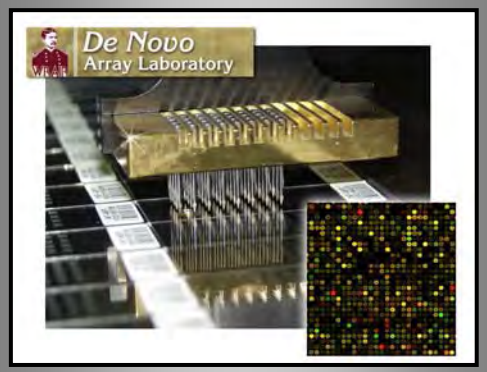
Future Products

- Environmental Sentinel Biomonitor
- Biomarkers
- Integrated Diagnostic Device



Walter Reed Army Institute of Research (WRAIR)





Expertise

- Vaccine and drug discovery and development
- Molecular biology of bacterial, viral, and parasitic pathogens
- Neuroscience

Facilities

- Vaccine Pilot-Scale Production Facility
  - Current Good Manufacturing Practice/Good Laboratory Practice-compliant operations
  - Viral, bacterial, and recombinant vaccines
- De Novo Microarray Laboratory
  - Production of custom cDNA print microarrays for analysis of gene expression and translation

Capabilities

- CW drug discovery and preclinical development
- Vaccine scale-up

WRAIR Activities

Recent Transitions

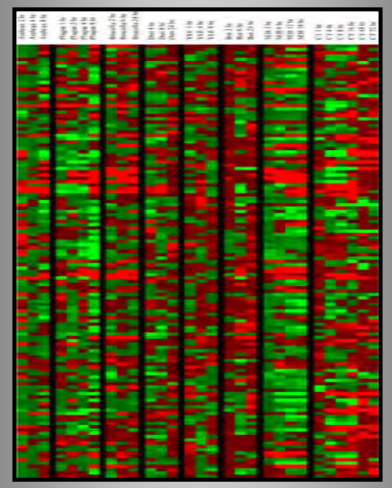
- Plasma-derived nerve agent bioscavenger

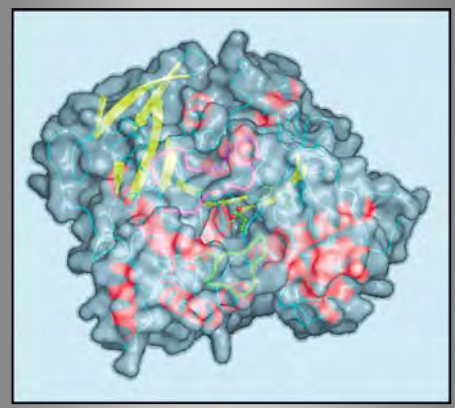
Current Efforts

- Host gene expression responses to biothreat agents
- Botulinum neurotoxin therapeutics
- Prophylactic skin patch vaccine for ricin
- Recombinant nerve agent bioscavenger

Partners Needed

- Skin/wound decontamination







SUCCESSFUL LIFECYCLE MANAGEMENT COMMAND

Defense Acquisition Regulations Directorate

INTEGRATION OF DOD AND FDA REGULATIONS



COLLABORATIVE COMMAND

Private Industry

Academia

International

For the USAMRMC, protection of the Homeland against BioWarfare threats means the National Interagency Biodefense Campus (NIBC)

THANK YOU


UNITED STATES ARMY MEDICAL RESEARCH AND MATERIEL COMMAND
RESEARCH * DEVELOPMENT * ACQUISITION * LOGISTICS * IM / IT * FACILITIES
LIFECYCLE MANAGEMENT & EXECUTION
PROTECT
PROJECT SUSTAIN

Colonel Patrick Sharon
Deputy Director for Counterproliferation Policy
Office of the Deputy Assistant Secretary of Defense
(Combating WMD and Negotiations Policy)

Building International Partnership Capacity to Combat WMD

Presented
to
***Joint CBRN Conference*, Fort Leonard Wood, MO**
27 June 2006

Building International Partnership Capacity

- A key theme in the Quadrennial Defense Review
- Targeted efforts to improve the collective capabilities and performance of the Department of Defense and its partners
- Partners include domestic and international
- Partnership capacity includes preventing hostile states and non-state actors from acquiring and using WMD

Our Goal – support and enable partnerships to improve policy, planning, and execution of national and homeland security missions

National Military Strategy to Combat WMD

Military Strategic Goal

Ensure that the United States, its Armed Forces, ***allies, partners, and interests*** are neither coerced nor attacked by enemies using WMD.

Military Strategic Objectives

- Defeat and Deter
- Defend, Respond and Recover
- Reduce, Destroy or Reverse
- Prevent, Dissuade or Deny

Strategic Enablers

- Intelligence
- Strategic Communications Support
- ***Partnership Capacity***

Military Mission Areas

- Offensive operations
- Elimination operations
- Interdiction operations
- Active Defense
- Passive Defense
- WMD Consequence Management
- ***Security Cooperation & Partner Activities***
- Threat Reduction Cooperation

Ongoing and Growing Efforts - Highlights

- **Pacific region**
  - Korea, Japan, Singapore
  - Multinational Planning Augmentation Team
- **NATO and Europe**
  - Multinational CBRN Defence Battalion
  - Czech Centre of Excellence
- **Middle East and Southwest Asia**
  - Cooperative Defense Program
  - Eagle Resolve

Contact Information



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Patrick.sharon@osd.mil (SIPRNET patrick.sharon@osd.smil.mil)
703-614-2247

National Guard Consequence Management Capabilities

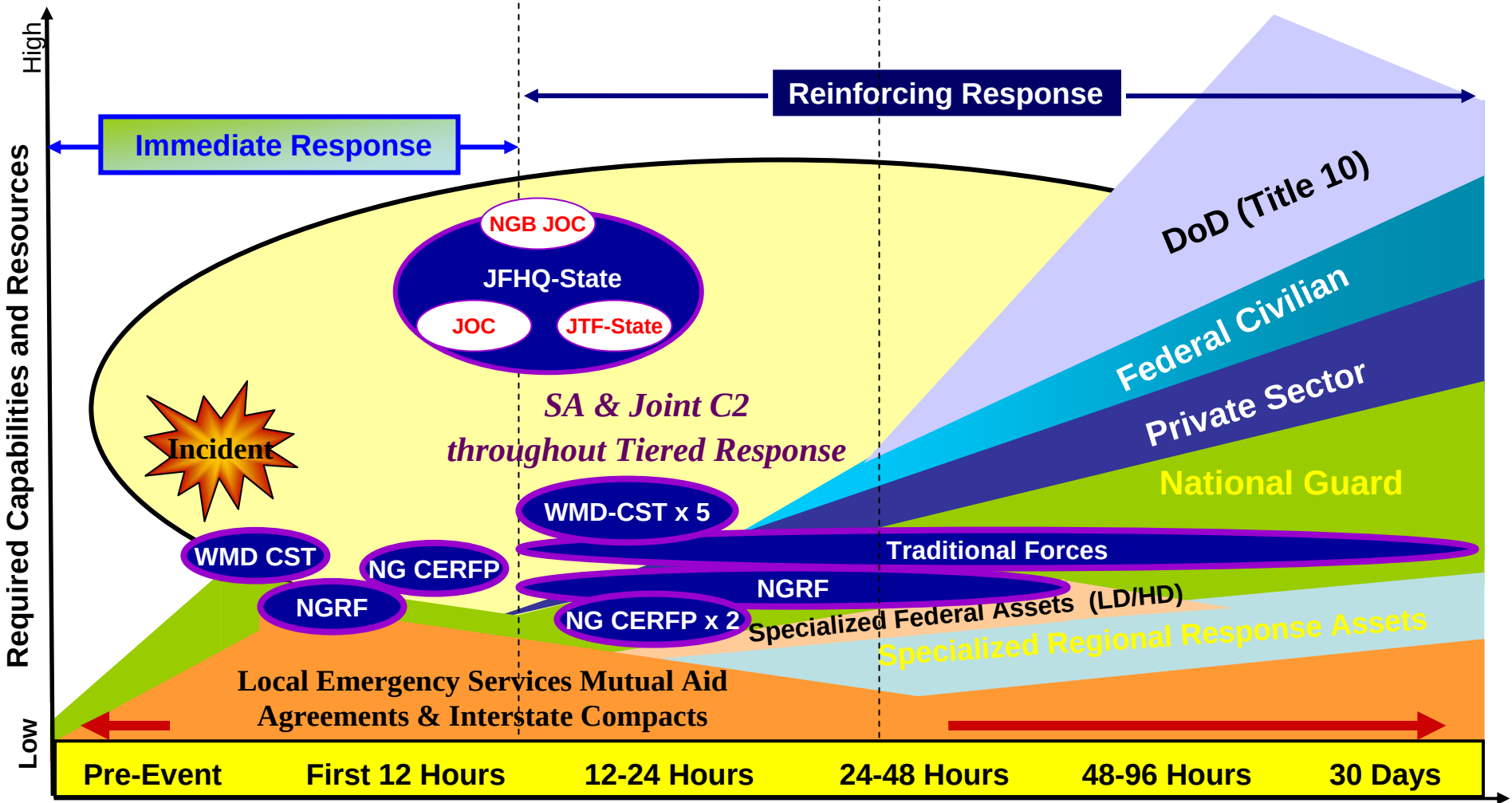
Vital Guardian

MISSION: The National Guard Bureau (NGB), with support from selected States, conducted a National Guard Collective Training Exercise, Vital Guardian, vicinity RFK Stadium, Washington, DC on 4 APR 06 to highlight National Guard capabilities to a target audience and provide States with a collective training event.

- **Who:**
  - **MI Joint Task Force - State (JTF- State) / Commander**
  - **NY Critical Infrastructure Protection-Mission Assurance Assessments (CIP-MAA)**
  - **VA Weapons of Mass Destruction Civil Support Team (WMD-CST)**
  - **WV CBRNE Enhanced Response Force Package (CERF-P)**
  - **MD National Guard Response Force (NGRF)**
  - **DC ARNG Joint Force Headquarters State / First Responders (JFHQ)**

- **Training event driven by DHS scenario #1 modified to a .5 KT device**

Response Spectrum



National Guard Capability In Each State

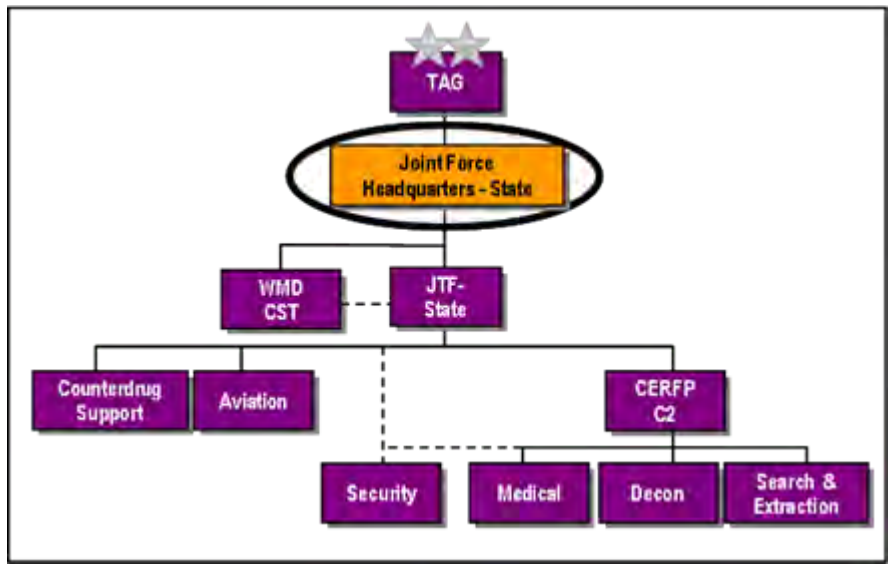
- **Joint Force Headquarters (JFHQ)**
  - **Provides pre designated JTF command elements for C2**
- **Weapons of Mass Destruction – Civil Support Team (WMD-CST)**
  - **Assists in restoring government function by:**
    - **Providing reconnaissance**
    - **Identifying chemical, biological, radiological hazards**
    - **Establishing interoperable reach back communications**
    - **Advising local incident command with Nuclear Science Officer expertise and predictive modeling**
    - **Assisting local incident command with asset requests**
- **National Guard Response Force (NGRF)**
  - **Provides security force**
- **Traditional forces to perform traditional roles**

National Guard Regional Capability

- **CBRNE Enhanced Response Force Package (CERFP)**
  - **Designed for immediate regional response**
  - **Trained in extraction from collapsed structure**
  - **Provides decontamination of casualties**
  - **Provides medical support integrated with decontamination**
- **Counter Drug**
  - **Provides aerial (136 aircrafts) and ground (11 Light Armored Vehicles) reconnaissance**
  - **Infra-red and live video capability**
- **National Guard Communication Element**
  - **Provides interoperable communications by bridging DoD and local responders**

National Guard Joint Force Headquarters

- **Integrated in every state and territory**
- **JFHQ in each state acts as conduit for integration of all available National Guard forces**
- **JFHQ in each state provides joint reception, staging, onward movement and integration of inbound forces**
- **JFHQ in each state assigns Joint Task Forces to provide regional command and control**



National Guard Intent

- **Purpose: The National Guard provides timely DoD Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives consequence management response to assist civil authorities of the affected states to establish control of the situation, save lives, mitigate human suffering, and facilitate response operations.**
- **Key State Tasks:**
  - **Provide mutual aid between supporting and affected States**
  - **Provide joint receiving, staging, onward movement, and integration (JRSOI) for inbound and outbound DoD forces in affected States**
  - **Joint Force Headquarters (JFHQ) appoints Joint Task Force State (JTF State) commander**

National Guard Intent

- **Key NGB Tasks:**
  - **Assist affected State Adjutants General in coordinating RFAs, RFIs and RFFs to support civil authorities**
  - **Be prepared to react quickly to support the incident with National Guard unique domestic response capabilities**
    - **Joint Force Headquarters State (JFHQ State)**
    - **Weapons of Mass Destruction – Civil Support Teams (WMD-CSTs)**
    - **CBRNE Enhanced Response Force Package (CERFP)**
    - **National Guard Response Force (NGRF)**
  - **Advise States on other available military capabilities**
  - **Develop Common Operating Picture (COP)**
  - **Provide Situational Awareness (SA) of National Guard forces to the Joint Staff and USNORTHCOM**

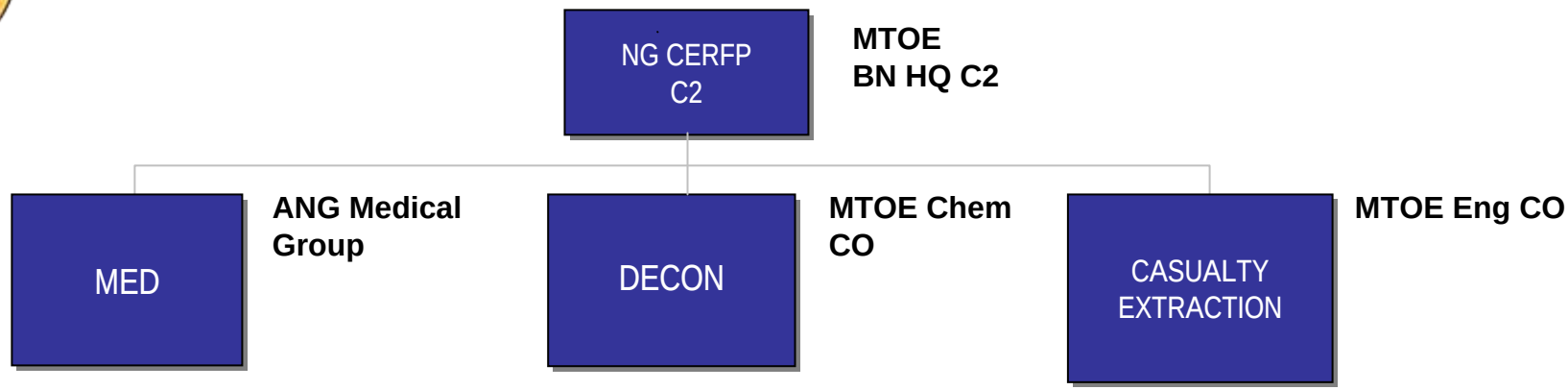
Why NG CERFP

- **Provide:**
  - **A regional Task Force with the capability to perform patient/casualty decontamination, medical triage and treatment and to locate and extract victims from a contaminated environment in support of civil or military authorities**
  - **A response to fill the 6 - 72 hour gap in capability**

    Note: In an immediate and unplanned response to the 9/11 attack, hundreds of NY guardsmen self reported to their armory within the first hour
  - **M-Day (traditional Guard) status until activated**
  - **Utilization in State Active Duty, Title 32 or Title 10**

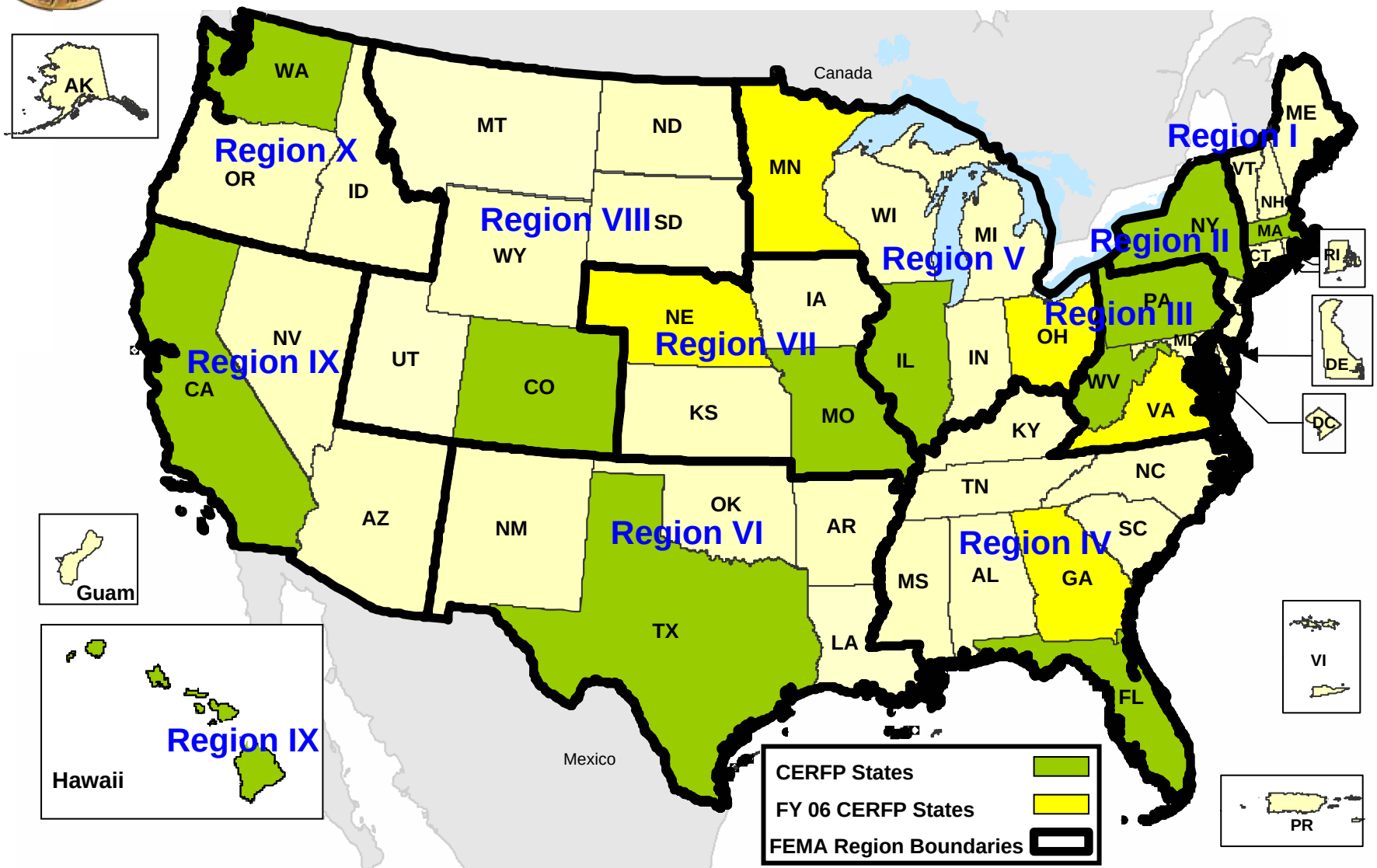
CJCSI 3125.01: Chief, National Guard Bureau (NGB), will: Monitor and assist the Adjutants General and the State National Guard in providing well-trained and well-equipped Army and Air National Guard forces and resources to provide military support to domestic CM operations in response to a CBRNE situation.

CERFP Organization

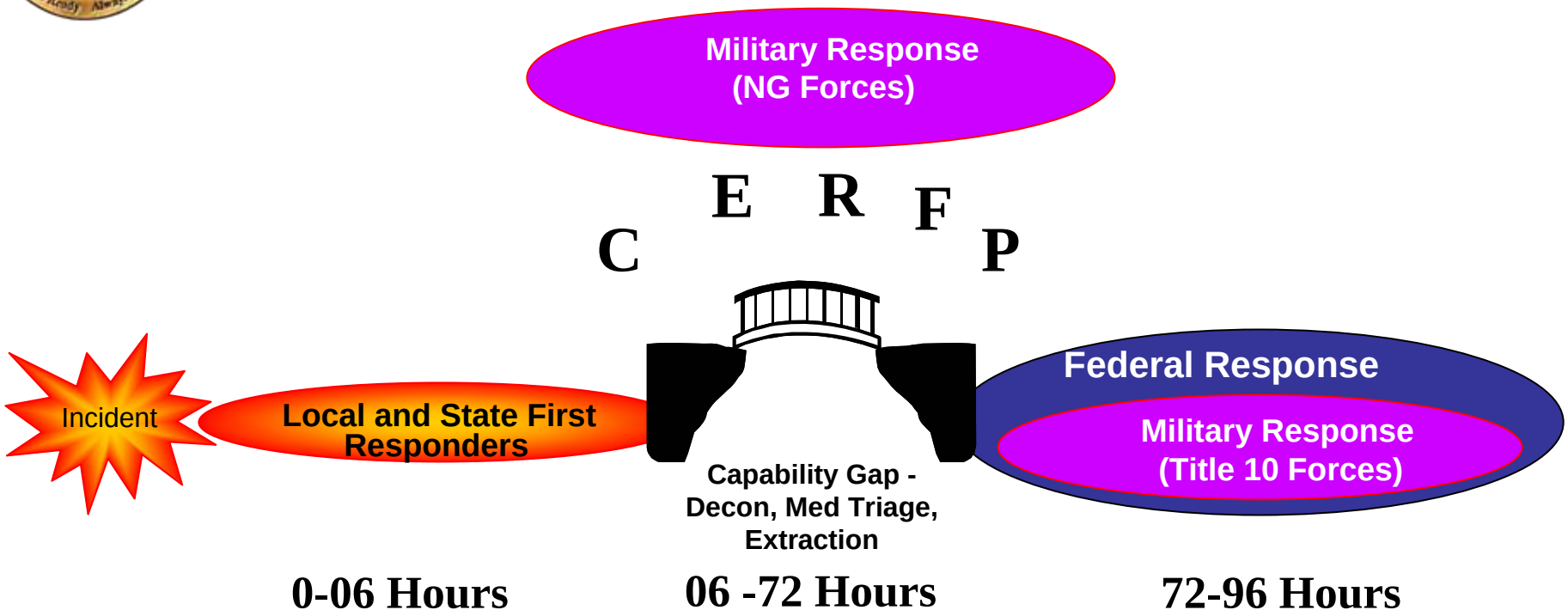


- This capability is dual mission and modular
- Units provided additional specialized equipment and training to perform operations in a WMD environment
- 14 additional days per year over the 39 days of statutory training
- Receive search and extraction training and meet NFPA certification to operate in confined space collapsed structure
- Passed external evaluation conducted by 1st and 5th Army
- Specialized equipment meets NIOSH/OSHA standards
- Units trained to operate within the National Incident Management System
- HAZMAT trained IAW NFPA 472 standards
- At least one NG CERFP in each FEMA Region

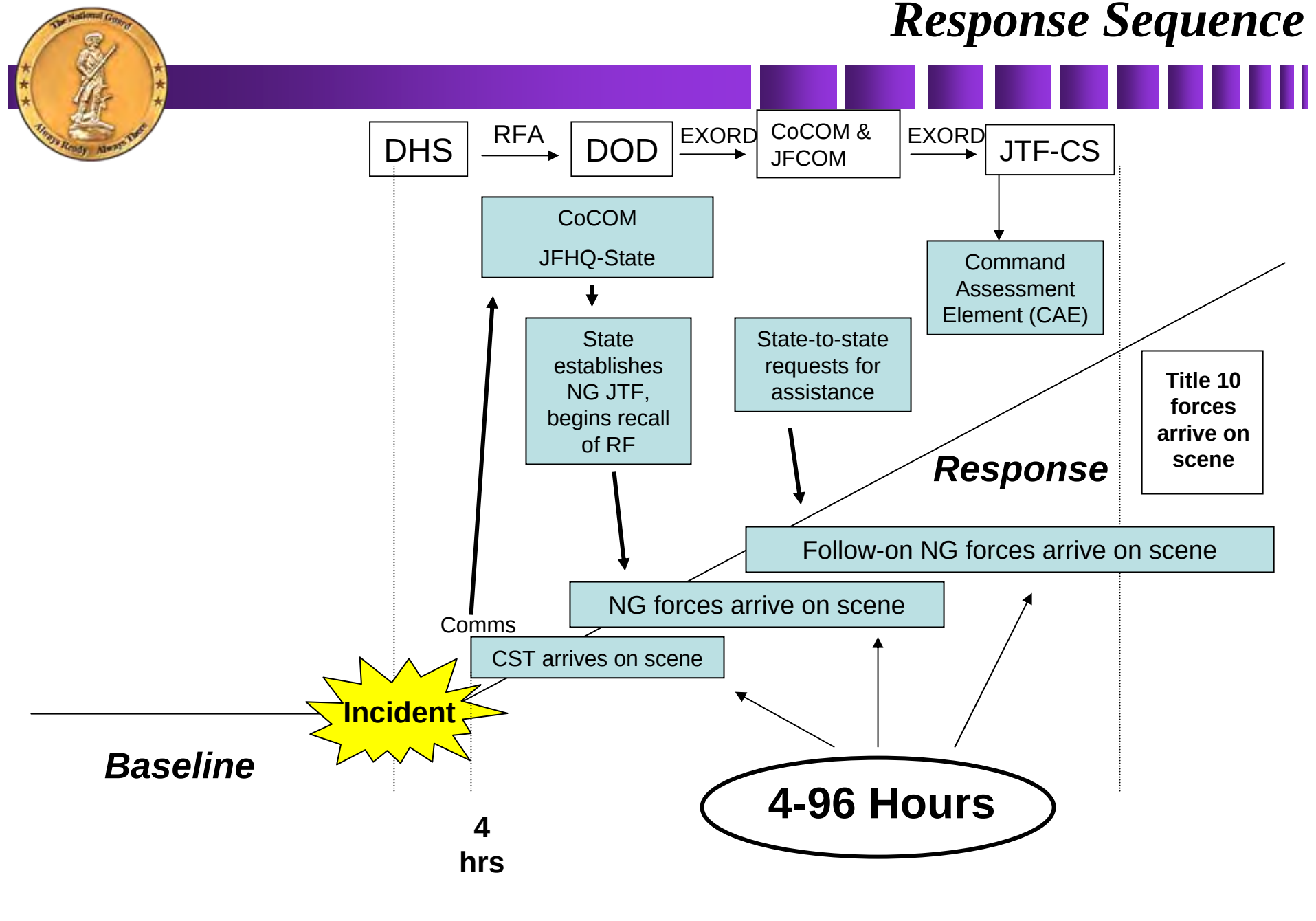
CERFP Locations



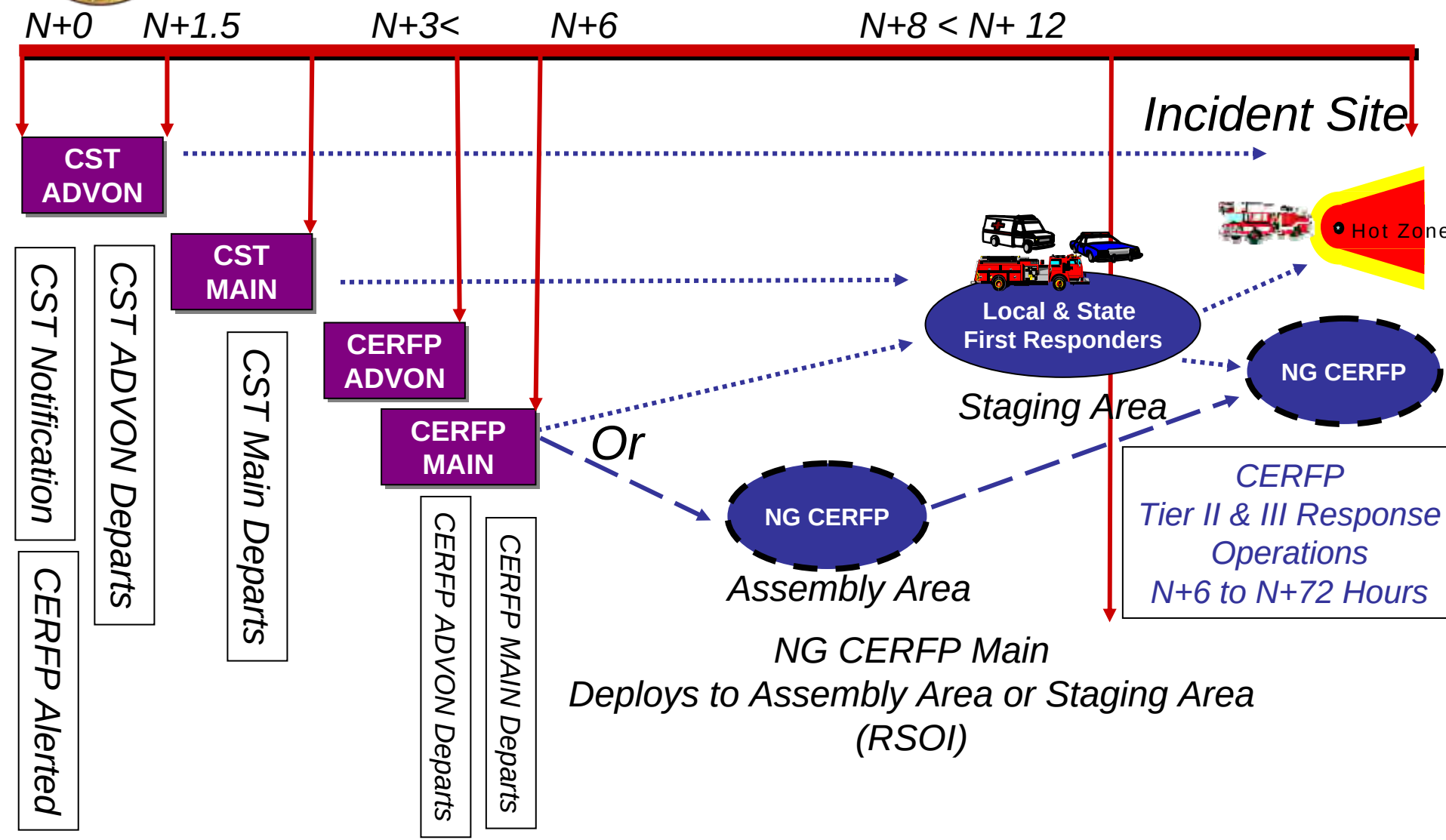
Bridging Capability



Response Sequence



Concept of Operation Response Timeline



Way Ahead

- JFHQ Joint Operations Centers continue to improve linkage with State Emergency Operations Centers in each State
- NGB JOC and JFHQ JOCs integration continues to mature
- CERFPs will expand from 12 to 17 directed in the FY 06 National Defense Authorization Act
- 36 WMD-CSTs currently certified with remainder (19) to be certified by 31 December 2006
- Continue to coordinate with interagency to improve overall response
- Continue to exercise with USNORTHCOM
- JROC validated the need and solutions (JROCM pending):
  - NG CERFP
  - JFHQ-State (JTF-State, JOC, NG Comm Element)

55 WMD CSTs by 31 December 2006

17 CERF-Ps by MAR '09

Questions and Answers

NG CERFP Casualty Extraction







Skeds: minor injury - minimum distances
Wheeled litters – reduces effort over longer evac distances
Mobile: evac for the seriously injury

Searching Under the Rubble Pile



Stabilizing the Extraction Point



Casualty Rescue



Extraction Course Medical Team Training





Extraction Course Medical Team Training



Extraction Team PPE



PAPR (Powered Air Purified Respirator)

- **Provides user with constant, filtered airflow and positive pressure**

- **Reduces inhalation hazards**



Listening Device

- **Magnifies faint or distant sounds**
- **Can hear sounds 100 yards away**
- **Tape record what you hear**
- **Adjustable volume**
- **Automatic safety shutoff at 95 decibles**
- **Powered by 1.9 volt battery**
- **Battery last approximately 40 hours**
- **Total weight 28oz**
- **Uses include search and rescue, law enforcement, personal security**



Thermal Imaging Camera

- **30 second Start Up time**
- **Human Size Target Detection Range-1200’**
- **Video Output to Television**
- **Rechargeable 6VDC-4 Included**
- **Standby mode**
- **Battery life 3hrs plus**
- **Weight 2.3 Pounds**
- **Tripod Mountable**
- **Thermal Images through walls can assist Search And Rescue teams in locating victims, can detect high heat output; I.e. fires, can detect personnel behind walls that may pose a threat to NGCERFP personnel**



Patient Decon Equipment



Shelter and Roller Systems



Casualty Backboard System



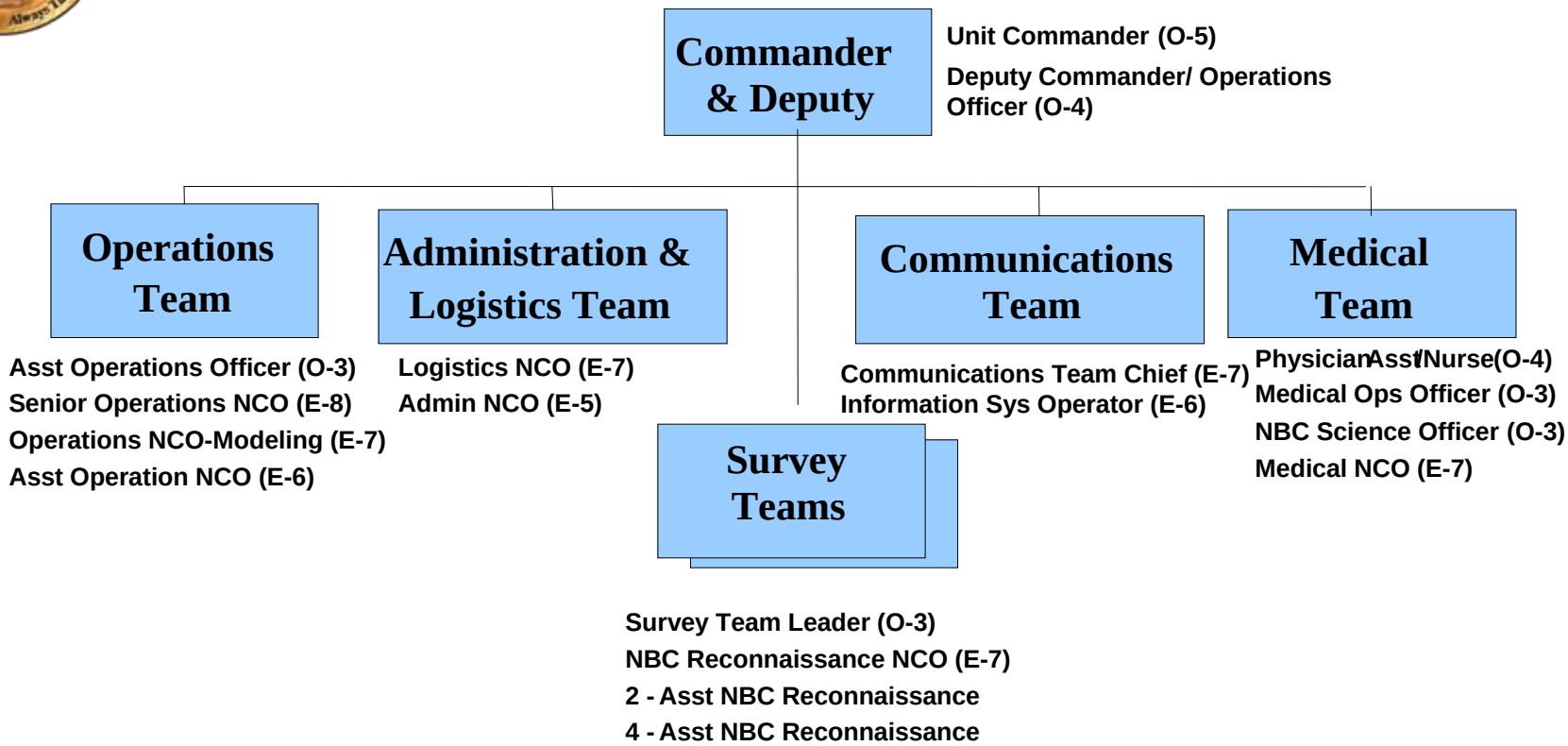
Ambulatory Decontamination: Monitoring Lane



TX-NG CERFP

Back-ups

CST Organization



WMD-CST & NG CERFP Contrast

- **WMD- CST**
  - **FAD 2 Unit**
  - **Army Executive Agent for the Program, funded by Army throughout the POM**
  - **Equipment and 22 full time AGRs documented on an approved Army TDA**
  - **36 Certified Teams; 19 Teams Standing-Up in FY05/FY06**
  - **DoD certifies to Congress the teams are trained organized and equipped**
- **NG CERFP**
  - **Task Force organized from existing units within 12 States**
  - **Established and sustained using existing NGB resources**
  - **No Separate TDA--Letter from NGB authorizing USPFOs to maintain the specialized equipment**
  - **NGB Working with NORTHCOM/PACOM to document requirement in the COCOM Integrated Priority List (IPL) and JCIDS Processes (DOTMLPF)**

Concept of operations

- **Three Phases of National Guard Response:**
  - **<u>Immediate Response</u>: Affected State internal response**
  - **<u>Reinforcing Response</u>: Integration of National Guard or other DoD assets from outside the affected state**
  - **<u>Transition</u>: Recovery of supporting assets back to home station**
- **Command and control built on State resources in all states and territories (JFHQ State)**
- **Response built on current available National Guard forces in CONUS**

Concept of operations

- **Immediate Response:**
  - **JFHQ JOC is notified of CBRNE incident and provides SA to NGB JOC**
  - **JFHQ assigns Joint Task Force (JTF) Commander(s)**
  - **N+90 Minutes - WMD-CST Advon deploys**
  - **N+3 hours - Entire CST deploys**
  - **N+4 hours - NGRF deploys**
  - **TAG deploys any regional assets under his control**
    - **N+6 hours - CERFP deploys**
    - **JCCSE and Counter Drug assets deploy**
  - **JFHQ establishes JRSOI for inbound and outbound forces**

Concept of operations

- **Reinforcing Response:**
  - **JFHQ JOC publishes RFAs and RFFs for National Guard supporting state assistance**
  - **Joint Force Headquarters (JFHQ) Joint Operations Center publishes RFIs required to support incident response**
  - **NGB Joint Enabling Teams (JETs) deploy to affected states**
  - **NGB facilitates resolution of RFAs, RFIs and RFFs (Troops to Tasks)**
  - **TAGs of supporting states deploy assets to affected state**
  - **JFHQ sustains forces by rotation to meet constraints on supporting states**
  - **NGB maintains COP and SA through NORTHCOM & NMCC**
  - **NGB assists in integration of Title 10 forces**

Concept of Operations

- **Transition (to state and local responders):**
  - **JFHQ releases forces to return to home state as tasks are completed**
  - **NGB assists JFHQ in recovery of DoD Title 10 Forces**
  - **NGB facilitates resolution of RFAs, RFIs, and RFFs**
  - **NGB maintains COP and SA through NORTHCOM**
  - **NGB recalls JETs as necessary**
  - **JFHQ releases State forces from JTF upon mission completion**

National Guard Forces will arrive in the affected area immediately and remain until all tasks are complete

NG CERFP METL

NG CERFP METL

Deploy the NG CERFP

Conduct Force Protection

Conduct NG CERFP Operations

- Supporting Battle Tasks

  - Conduct Search and Extraction Operations

  - Conduct Medical Operations

  - Conduct Decon Operations

Conduct NG CERFP Sustainment Operations

Conduct NG CERFP Recovery Operations

NG CERFP STAFF METL

Perform RSOI of the NG CERFP

Conduct mission planning

Conduct C3 Operations

MISSION

On order, respond to a Chemical, Biological, Radiological, Nuclear, or High Yield Explosive (CBRNE) incident and assist local, state, and federal agencies in conducting consequence management by providing capabilities to conduct **personnel decontamination**, **emergency medical services**, and **casualty search and extraction**.

CJCSI 3125.01: Chief, National Guard Bureau (NGB), will: Monitor and assist the Adjutants General and the State National Guard in providing well-trained and well-equipped Army and Air National Guard forces and resources to provide military support to domestic CM operations in response to a CBRNE situation.

NG CERFP
Medical Element (SPEARR)

- **ANG Medical Group, 45 personnel**
- **Small-Portable-Expeditionary-Aeromedical-Rapid Response**

(EMEDS-Expeditionary Medical Support)

<u>SPEARR is the first Module of the EMEDS</u>

- **Provides: Triage, Emergency medicine, critical care stabilization, Emergency surgery, patient prep. for Evacuation.**

<u>TRIAGE - PATIENT DECON - STAGING</u>

Combating WMD
Joint CBRN Conference 2006
Fort Leonard Wood

Dr. James A. Tegnelia, Director,
Defense Threat Reduction Agency and
USSTRATCOM Center for Combating WMD

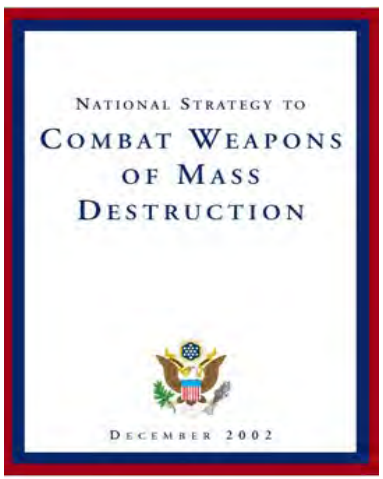
Outline

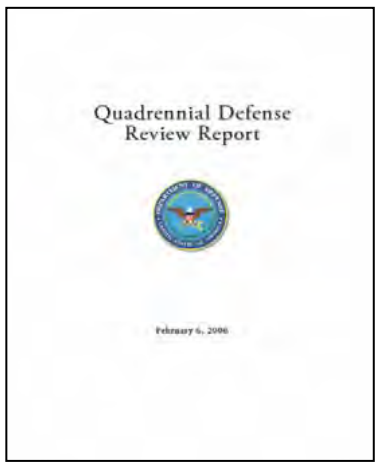
- Combating WMD Strategic Framework
- USSTRATCOM and DTRA Responsibilities
- Programmatic Response
- The Future – Our People

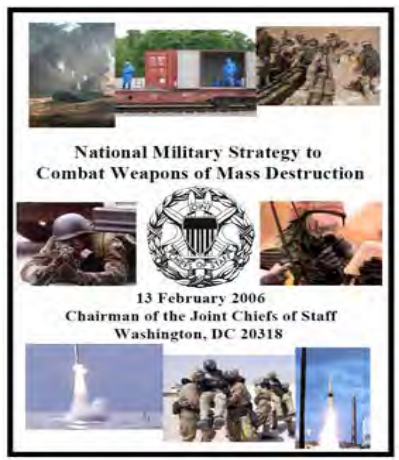
Combating WMD Strategic Framework

Guidance for combating WMD

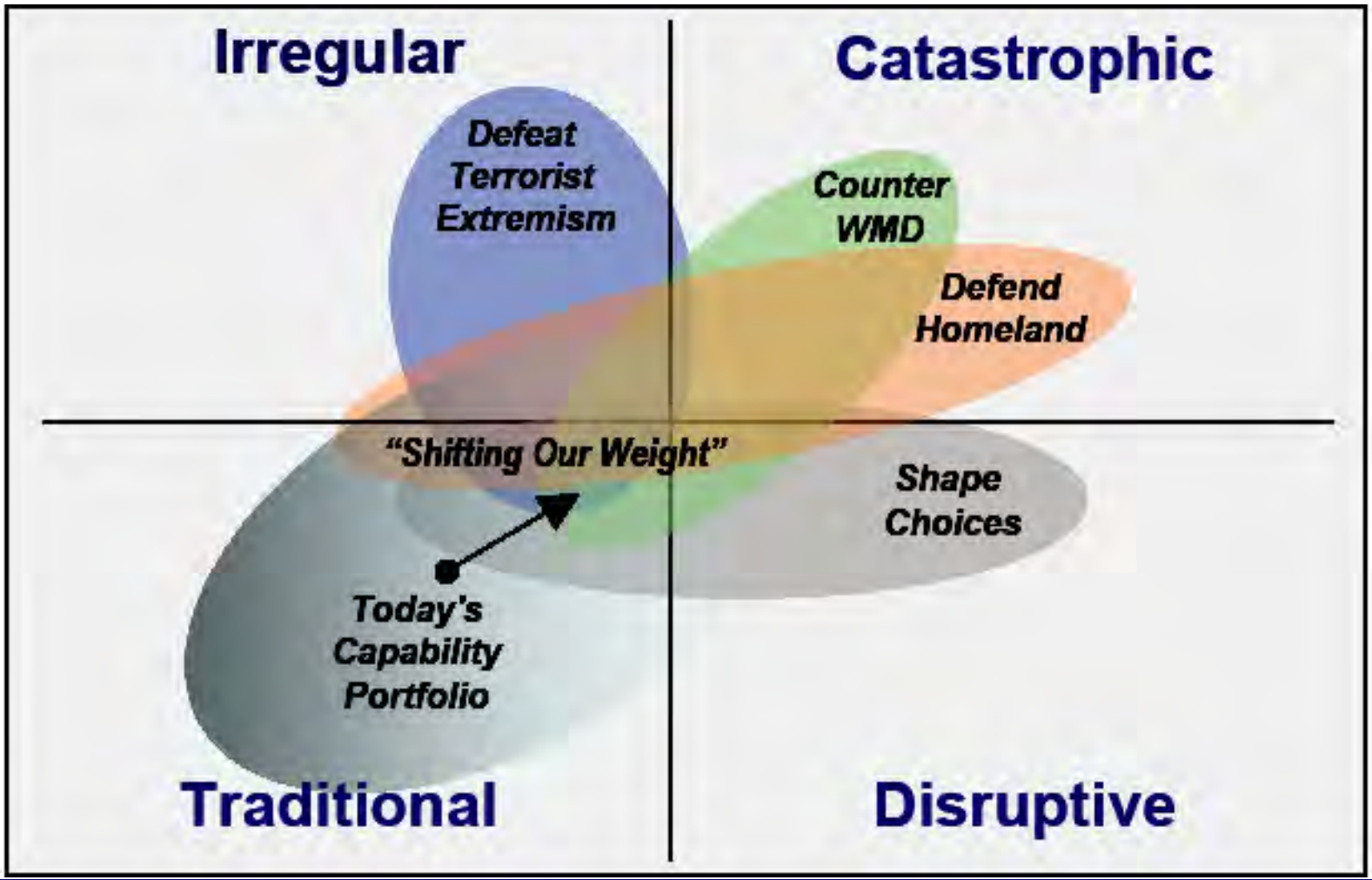
- National Strategy for Combating WMD - 2003
- National Implementation Plan – 2006
- National Military Strategy for Combating WMD – 2006
- CONPLAN 8099 – 2006
- Quadrennial Defense Review and Strategic Planning Guidance - 2006





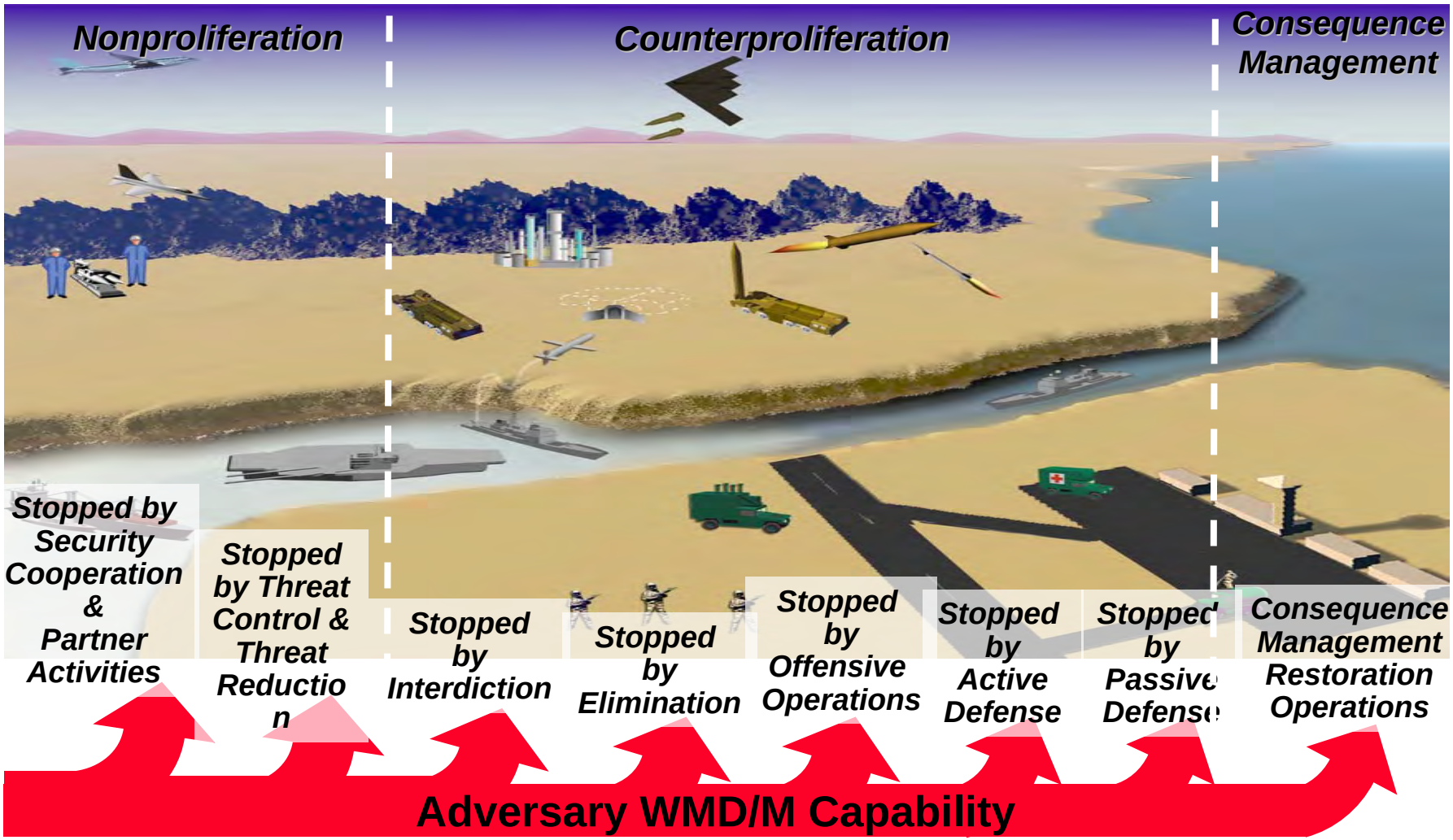


A strategic shift in focus



Continuing the reorientation of military capabilities and implementing enterprise-wi reforms to ensure structures and process support the President and the warfighter

National Strategy: a layered defense



New emphasis in combating WMD

- From predictability to surprise and uncertainty
- From focus on protecting the force to protecting society at large
- From military operations to integrated interagency activities employing all elements
- of national power
- From direct US military action to building partner capabilities
- From responding after action starts to anticipatory actions as a means to dissuade and deter

USSTRATCOM and DTRA Responsibilities

USSTRATCOM – then & now

1956



Largest COCOM HQ
Single mission focus
Internal focused planning
Supported for single mission execution
Deterrence through retaliation

2006



Small HQ staff
Multi mission focus:
enable JFCCs
Collaborative/adaptive plans
Focused on providing capabilities to COCOMs
Broad mission areas
Broad spectrum influence

Accelerated transformation to strengthen the joint warfighter…

Joint Functional Component Commands



JFCC-SGS
Lt Gen Chilton
Offutt AFB



JFCC-ISR
LTG Maples
Bolling AFB



JFCC-NW
LTG Alexander
Ft. Meade



JFCC-IMD
Crystal City VA
Schriever AFB
LTG Dodgen

SCC-WMD
Dr Tegnelia
Ft. Belvoir





JSpoC
Maj Gen Shelton
Vandenberg AFB



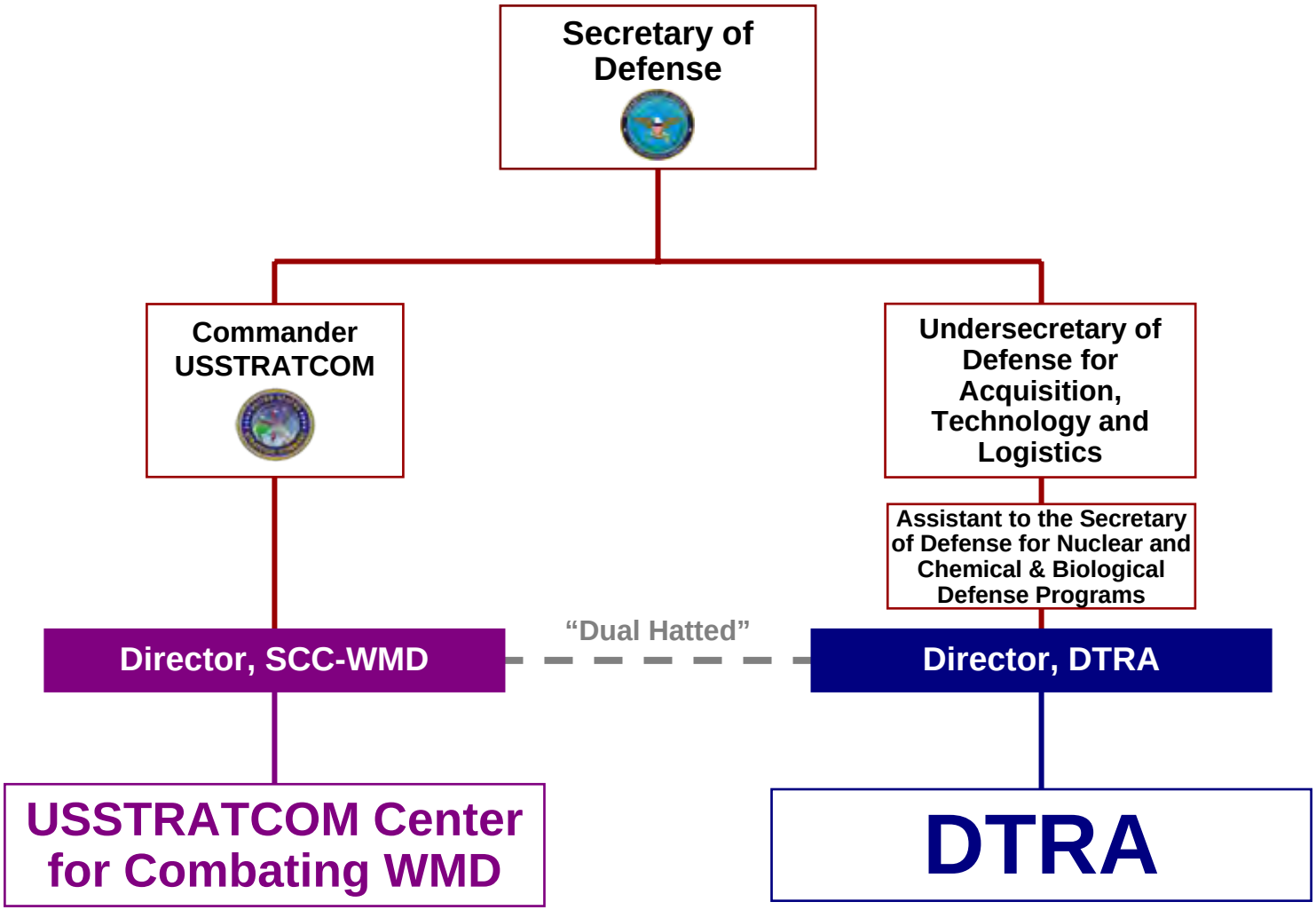
JIOC
Maj Gen Koziol
Lackland AFB

AOC
Lt Gen Chilton
Barksdale AFB



JTF-GNO
Lt Gen Croom
Arlington VA

Command structure & relationships



Programmatic Response

Providing capabilities to the COCOMS

Nonproliferation



Foreign Assistance Activities

Counterproliferation

Hard Target Research and Analysis Center

Technical Reachback Capabilities

Consequence Management



Training & Exercises

Programmatic initiatives

- Loose nuclear weapons
  - Locate, target and track
  - Render Safe
  - Attribution
- WMD elimination
  - CONOPS development underway
  - Army staff, TRADOC, 20th Support Command, USSTRATCOM
- Bio Initiative
  - FY 06-11 program issue and QDR initiative
  - Working with USAMRIID, JRO, JPEO, NCB, DTRA

The Future – Our People

Building the future workforce



National Security Personnel System



University Strategic Partnership

- Combating WMD is a multi-discipline, multi-generational challenge
- Must build next generation scientific/technical workforce while solving today's technical challenges.



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Back Ups

SCC-WMD chronology

- 06 Jan 05 – SecDef Memo: "I assign CDRUSSTRATCOM as the lead combatant commander for integrating and synchronizing DoD in combating WMD."
- 02 Feb 05 – CJCS Warning Order
- 26 Aug 05 – SCC-WMD Establishment Memo
- 26 Aug 05 – SCC-WMD Implementation Directive
- 26 Jan 06 – SCC-WMD declared IOC
- 31 Jan 06 – SecDef 'dual hats' DIR/DTRA
- 04 Apr 06 – DDIR/SCC-WMD onboard
- 05 May 06 – UCP-06 approved

SCC-WMD mission

The Center will integrate and synchronize DoD efforts to combat WMD in support of US government objectives. The Center will develop and maintain global situational awareness of WMD activities, advocate for combating WMD capabilities, and assist with WMD planning, while shifting emphasis from DoD-centric approaches toward interagency solutions.

SINGAPORE ARMED FORCES

CHEMICAL BIOLOGICAL RADIOLOGICAL & EXPLOSIVES DEFENCE GROUP



COL HO KONG WAI

COMMANDER, CBRE DG

27 June 2006

PRESENTATION SCOPE

- Video & Introduction
- Vision and Mission
- Structure & Organization
- CBRE Operations in Singapore
- Enhancing CBRE DG Capabilities
- CBRE Ops-Tech Integration

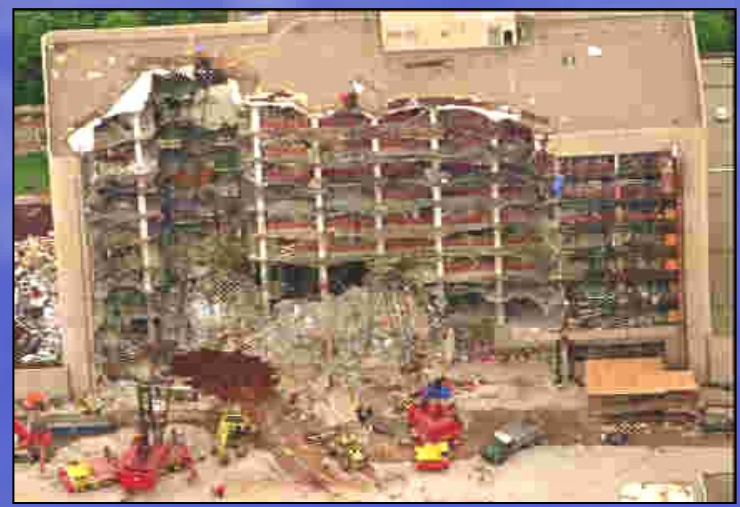
GROWING TERRORIST THREATS

- Gulf War prompted the SAF to begin Individual Chemical Defence Training in 1991
- Tokyo Subway SARIN Gas Attack and Oklahoma City Bombing reinforced the need
- SAF developed limited chemical response capability in 1996 for WTO Meeting in Singapore



SAF – CBRE CAPABILITY BUILD UP

- National level Inter-Ministry Working Committee (IMWC) conceived in 2000
- Sep 11 & Anthrax attacks : Developed National Ops Capability to address CBRE terrorist threats
- CBRE Defence Group was formed in Oct 2002



CHALLENGES



- Global city with a high population density
- Need to contain and minimize impact
- Enhance confidence in homeland security
- Prevent its use as an instrument of fear
- Paradigm shift from conventional to Terrorist Threat orientation
- New challenges in Improvised Explosive Devices containing CBR Payloads
- CBRE Operations shifted from Open terrain to Enclosed places

OUR VISION

Be A World-Class Operationally Ready & Technologically Advanced CBRE Force

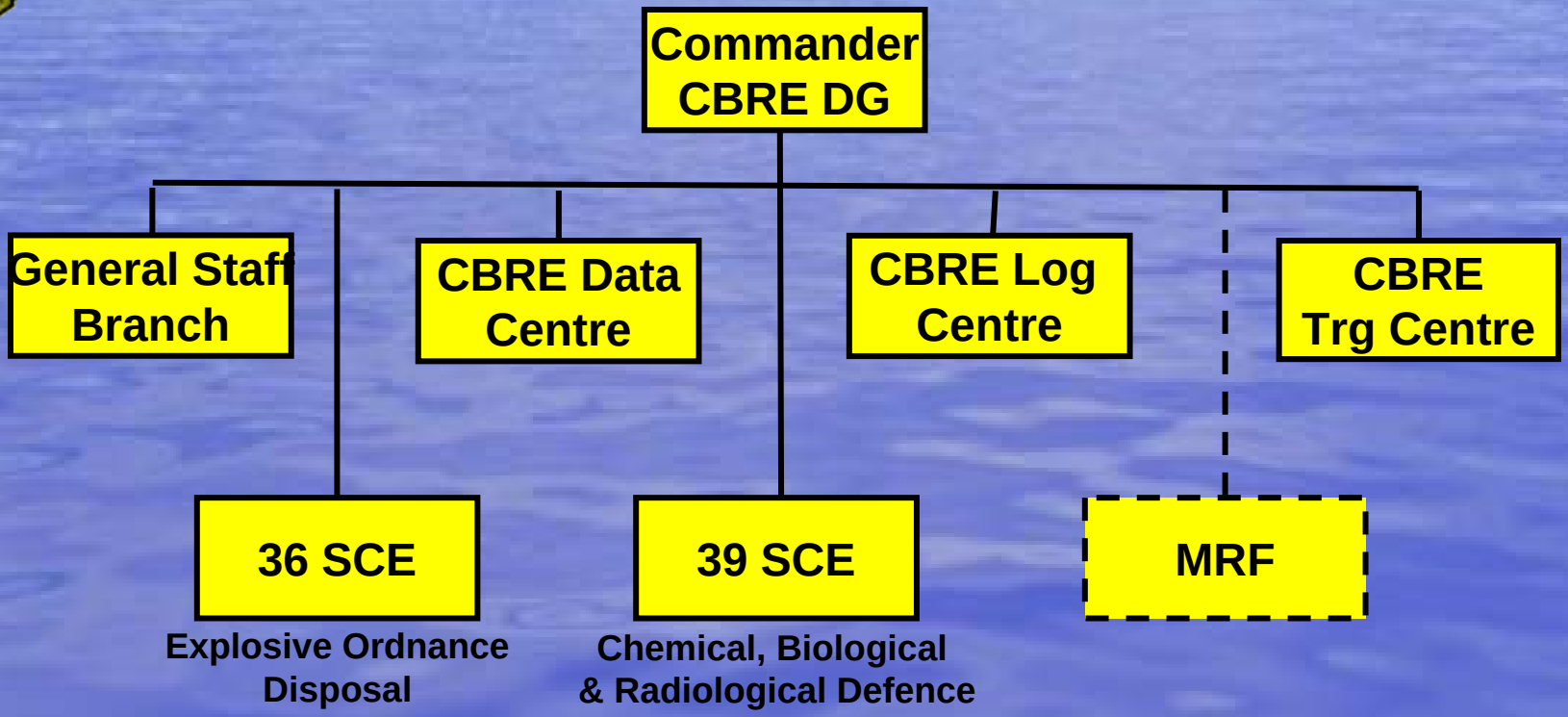
OUR MISSION

Provides Specialist CBRE Advice and Support throughout the Spectrum of Operations.

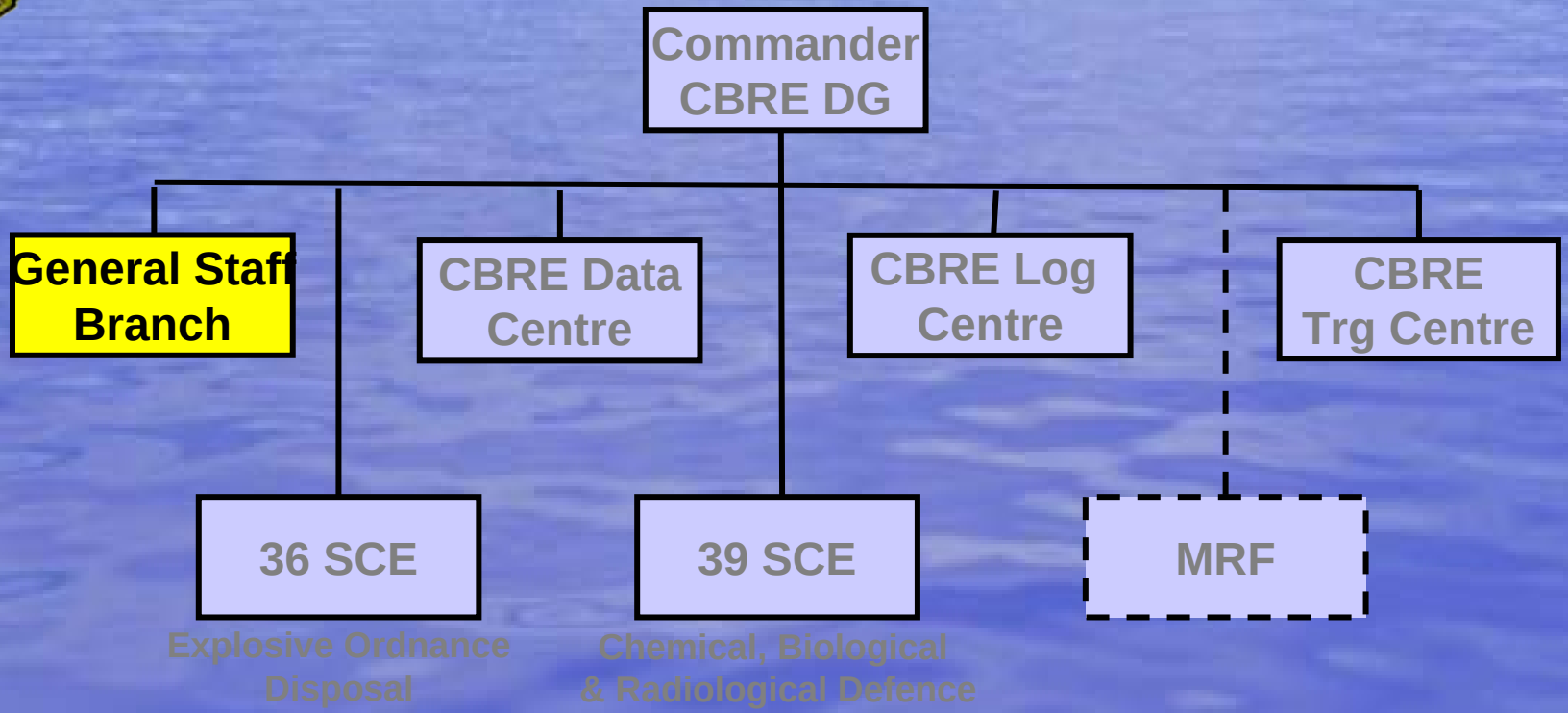
Key Success Factors

REACH	RIGHT PEOPLE	RICHNESS
Deploy high readiness CBRE expertise to geographical locations in Singapore and the region	*Tapping the expertise of the right people at the various levels*	*CBRE professional knowledge, skills and application of advanced technology in operations.*

STRUCTURE & ORGANIZATION



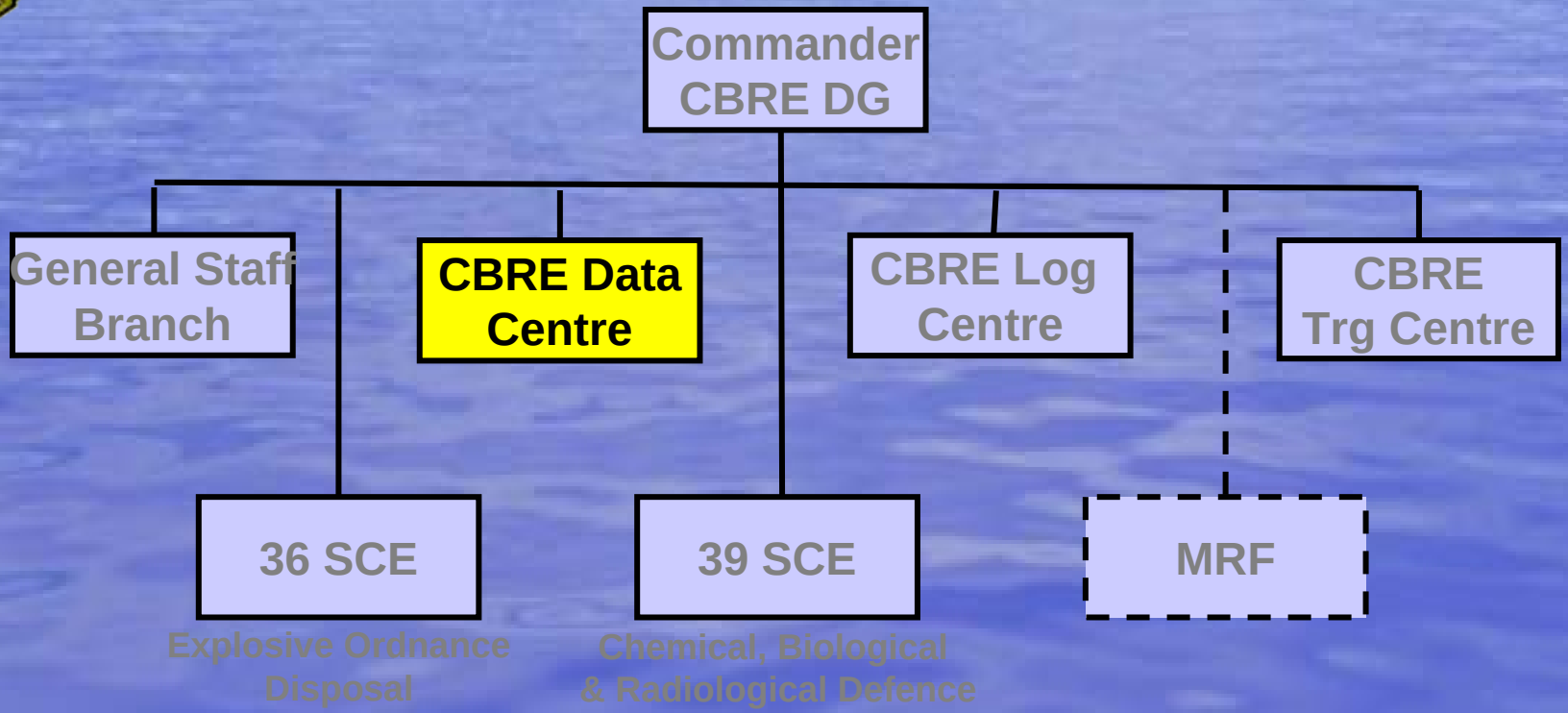
STRUCTURE & ORGANIZATION



- Plan and manage CBRE operations in full spectrum of operations
- Develop CBRE doctrine and training
- Drive and manage CBRE Technology Acquisition / S70 Research & Development
- Manage MP ROA for all CBRE vocationalists



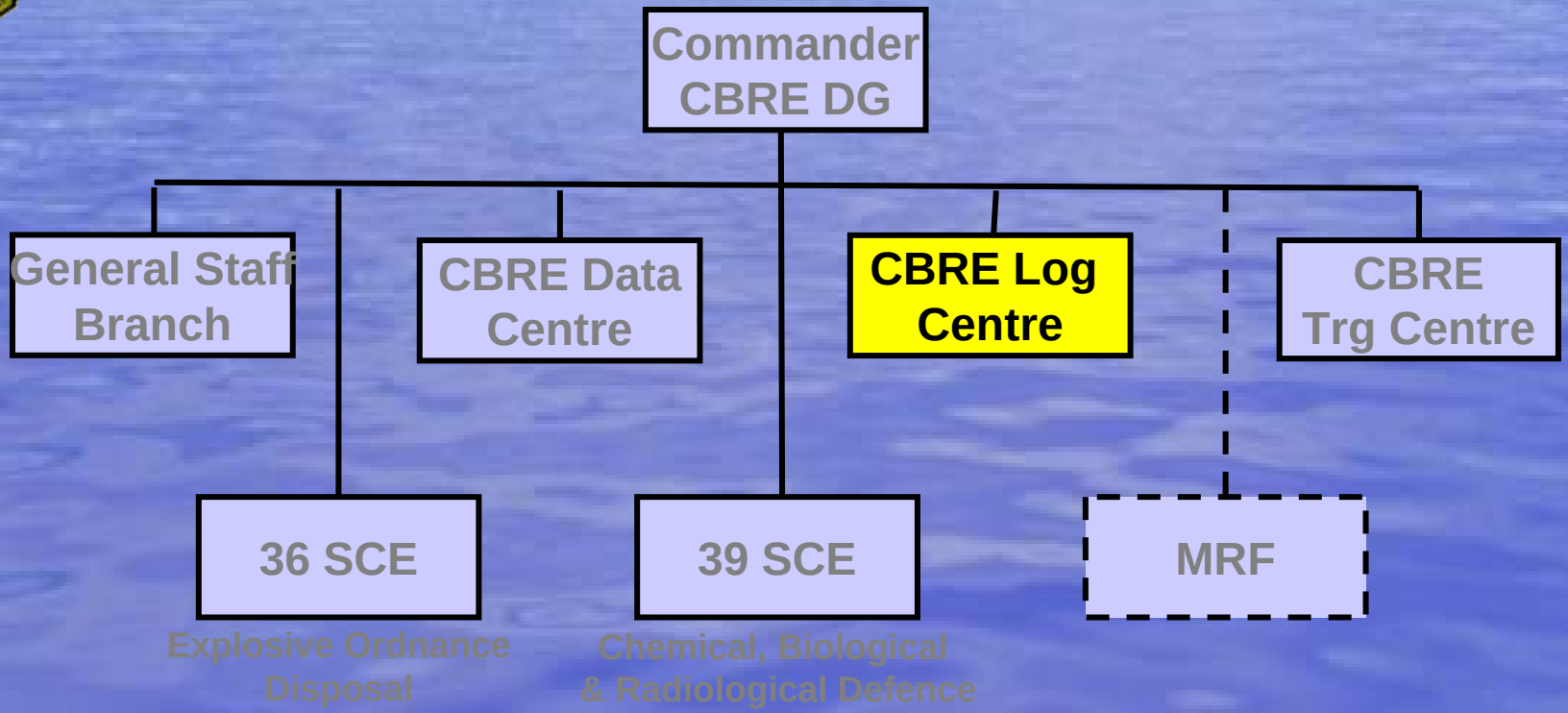
STRUCTURE & ORGANIZATION



- Conduct intelligence and operational research for operational, doctrinal and capital development
- Provide both distant and on-scene CBRE intelligence support.
- Provide post CBRE incident investigation support



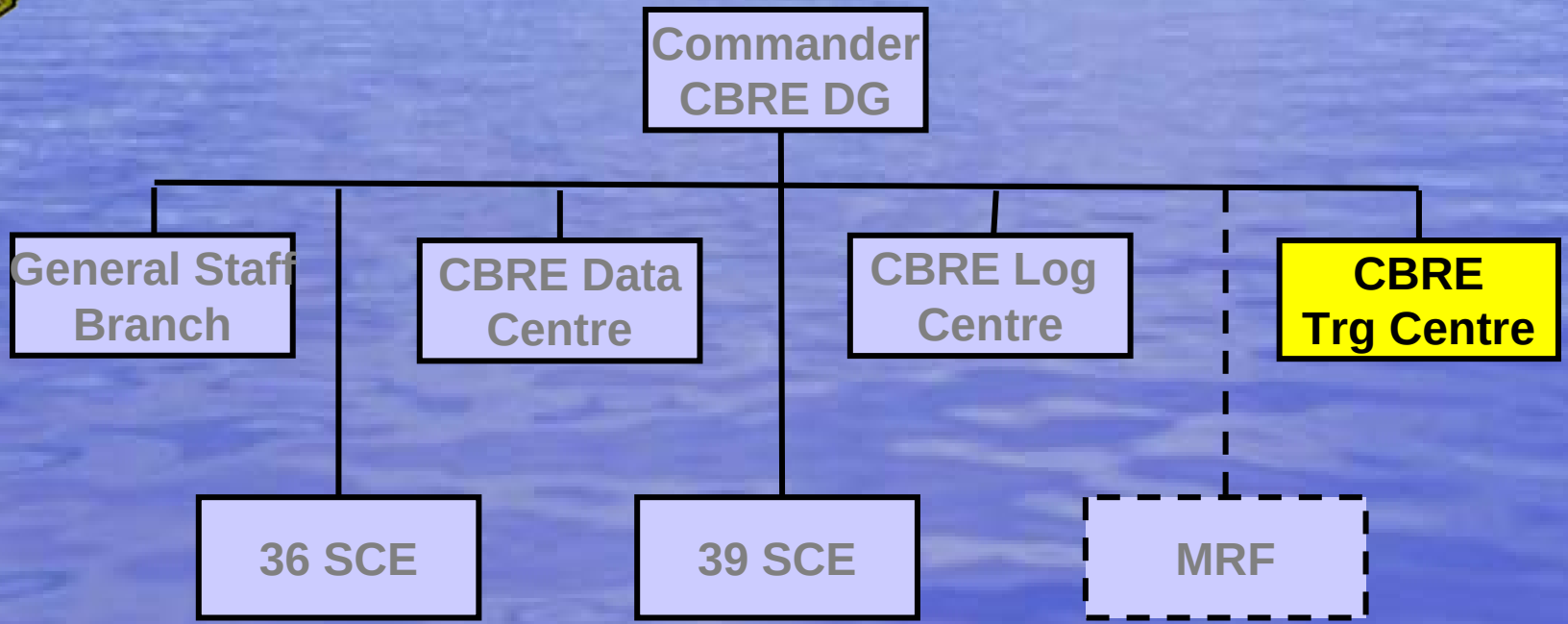
STRUCTURE & ORGANIZATION



- **Maintain high logistics readiness**
- **Oversee and manage the supply of centralised stores**
- **Provision of dedicated and unique maintenance for CBRE equipment**
- **Maintaining a 4-hr repair capability**



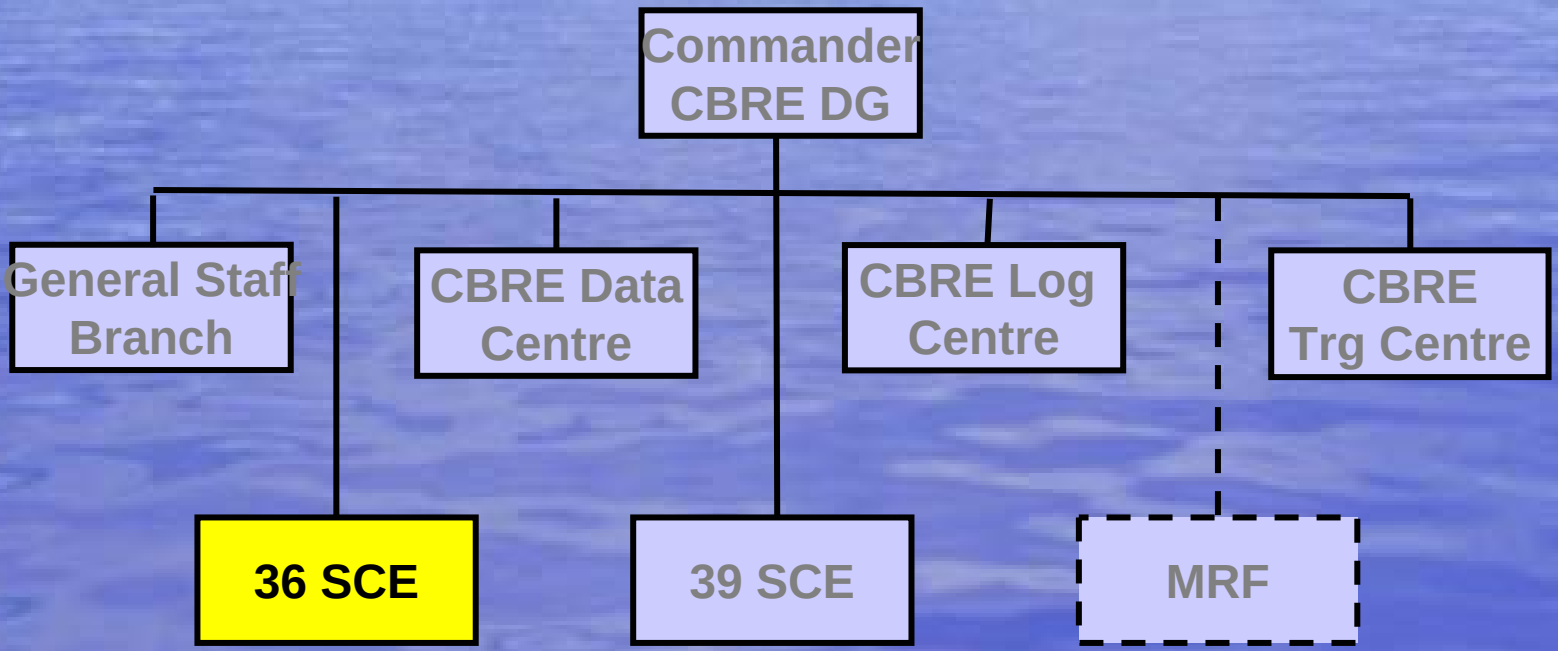
STRUCTURE & ORGANIZATION



- Develop CBRE course syllabus and training packa
- Conduct CBRE vocational courses for Commande
- Conduct of NS ICTs
- Evaluate Annual ETEPs
- Assist to conduct evaluation trials to enhance ops and training needs



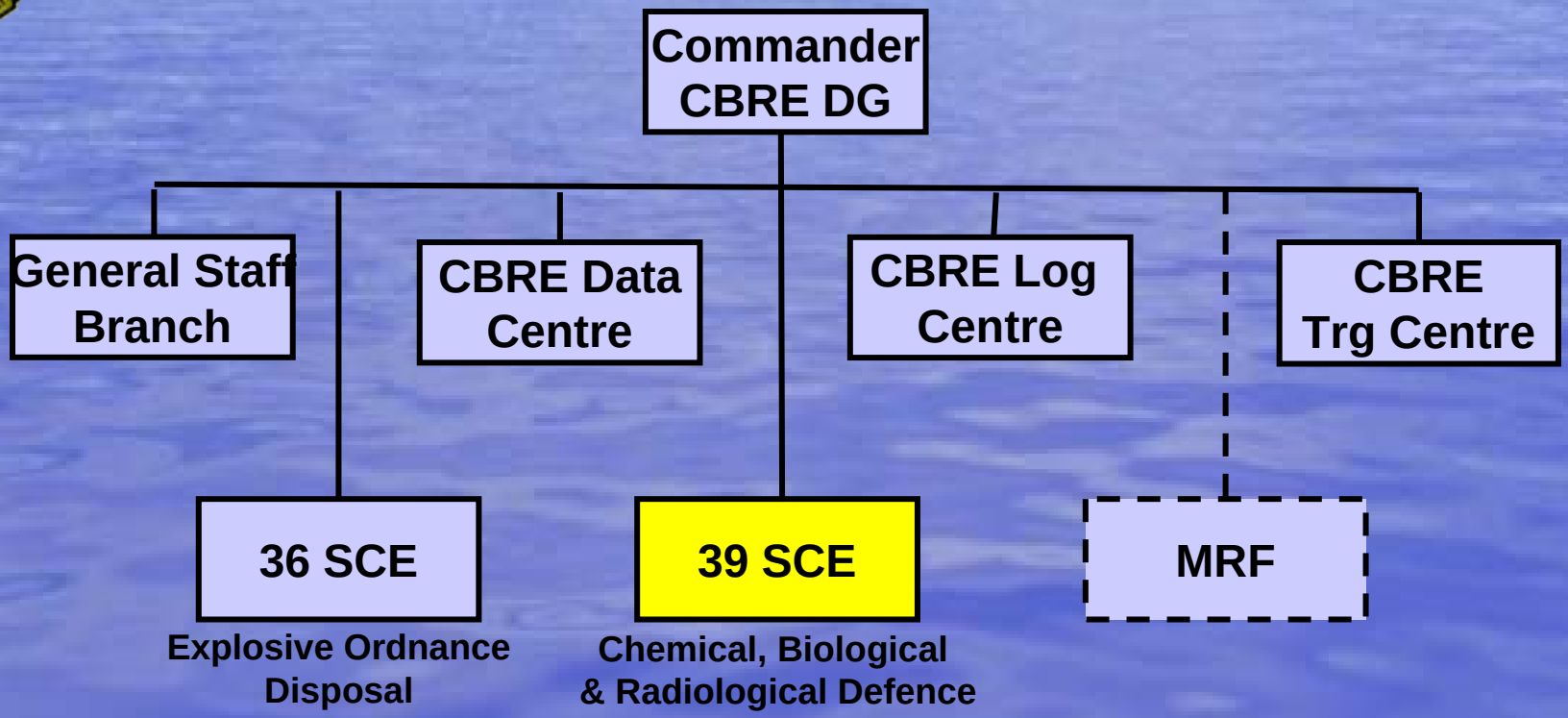
STRUCTURE & ORGANIZATION



- Preventive Bomb Sweeps
- Conventional EOD Clearance
- IED Disposal Operations with CBR payloads
- Post Explosion Investigation



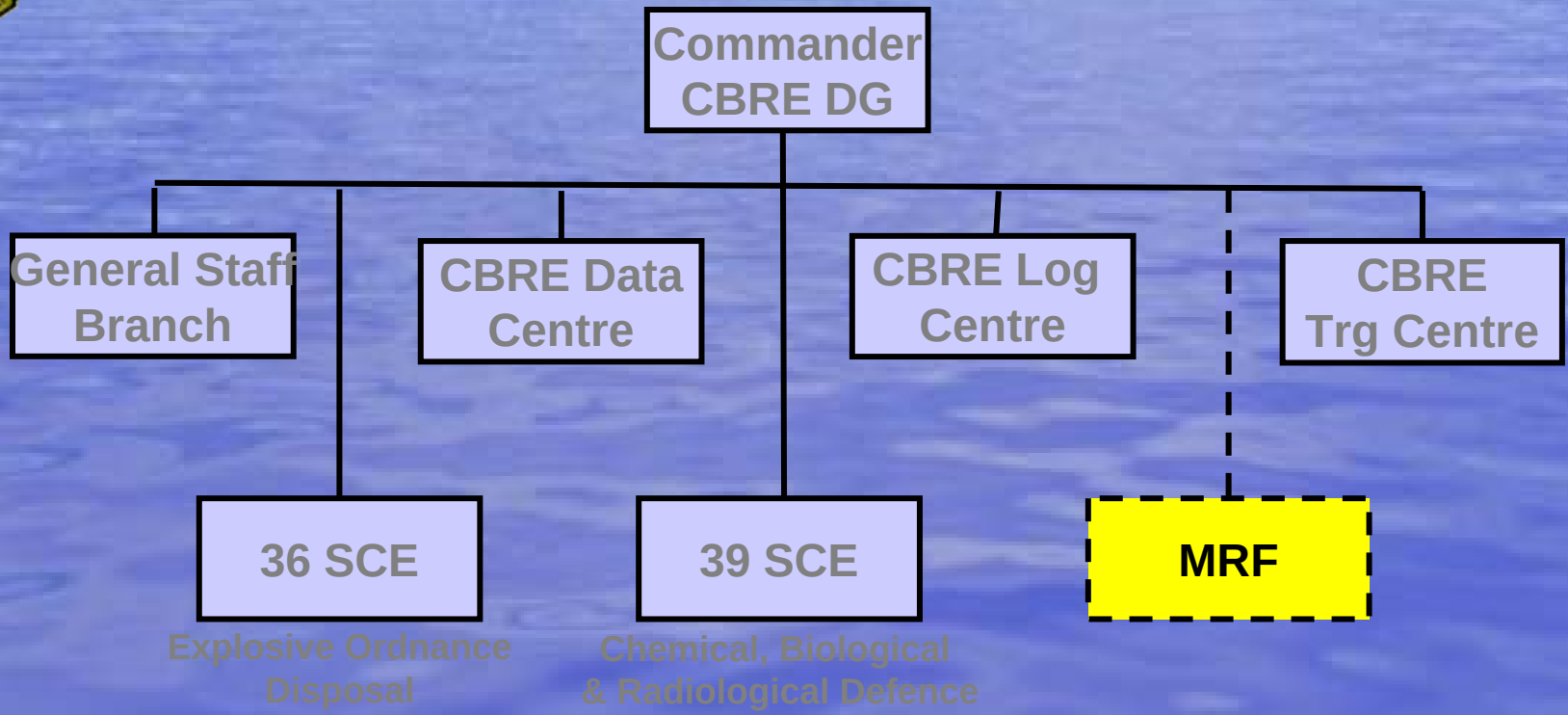
STRUCTURE & ORGANIZATION



- Preventive CBR Sweeps
- Surveillance, Sampling, Detection
- & Identification of CBR Threats
- Decontamination Operations
- Post Incident Monitoring



STRUCTURE & ORGANIZATION



- **Provide on-site medical treatment for chem - bio casualties**
- **Evacuate casualties to hospitals**



CBRE OPERATIONS IN SINGAPORE

- Maintain ops response at 15min NTM
- Maintain a Step-up system if earlier section has been activated for response
- Additional assets to be placed on standby at higher THREATCON levels
- Command and Control *multiple* CBRE incidents



CBRE OPERATIONS IN SINGAPORE

Recent events

- Letter Bomb at Myanmar Embassy (Oct 02)
- SARS - MOH Ops Group (May 03)
- Ops FLYING EAGLE III (Jan 05)
- Chemical incident inside Changi Air Base (Apr 06)
- CBRE Search Ops onboard MV President Adams (May 06)









CBRE OPERATIONS IN SINGAPORE

Year 2005

- World Economic Forum (28 - 29 Apr 05)
- IISS Asia Security Summit - The Shangri-la Dialogue (3 - 5 Jun 05)
- International Olympic Committee (IOC) Session (2 - 9 Jul 05)
- National Day Parade (NDP) Preview & NDP (30 Jul & 9 Aug 05)

Year 2006

- Asian Aerospace (21 - 26 Feb 06)
- Singapore General Elections (27 Apr - 6 May)
- IISS Asia Security Summit - The Shangri-la Dialogue (2 - 4 Jun 06)
- NDP Preview (29 Jul 06)
- National Day Parade (6 - 9 Aug 06)
- IMF - World Bank Conference (Singapore 2006) (12 - 20 Sep 06)

Enhancing CBRE DG Capabilities

- Minimize risk exposure, integrate COTS Robots with
  - CBRE Detection
  - Mitigation
- Early warning, evaluate COTS stand-off detection and identification for CBRE threats
- Deal with ‘Dirty Bombs’
  - Render-safe
  - Containment







Medical Bio-Defence

Physical Countermeasures

Chemical, Biological & Radiological Defence (CBRD)

Defence Medical & Environment Research Institute (DMERI)

DEFENCE SCIENCE ORGANISATION

- NATIONAL LABORATORIES

Medical Countermeasures - Chem

Detection & Verification

THANK YOU